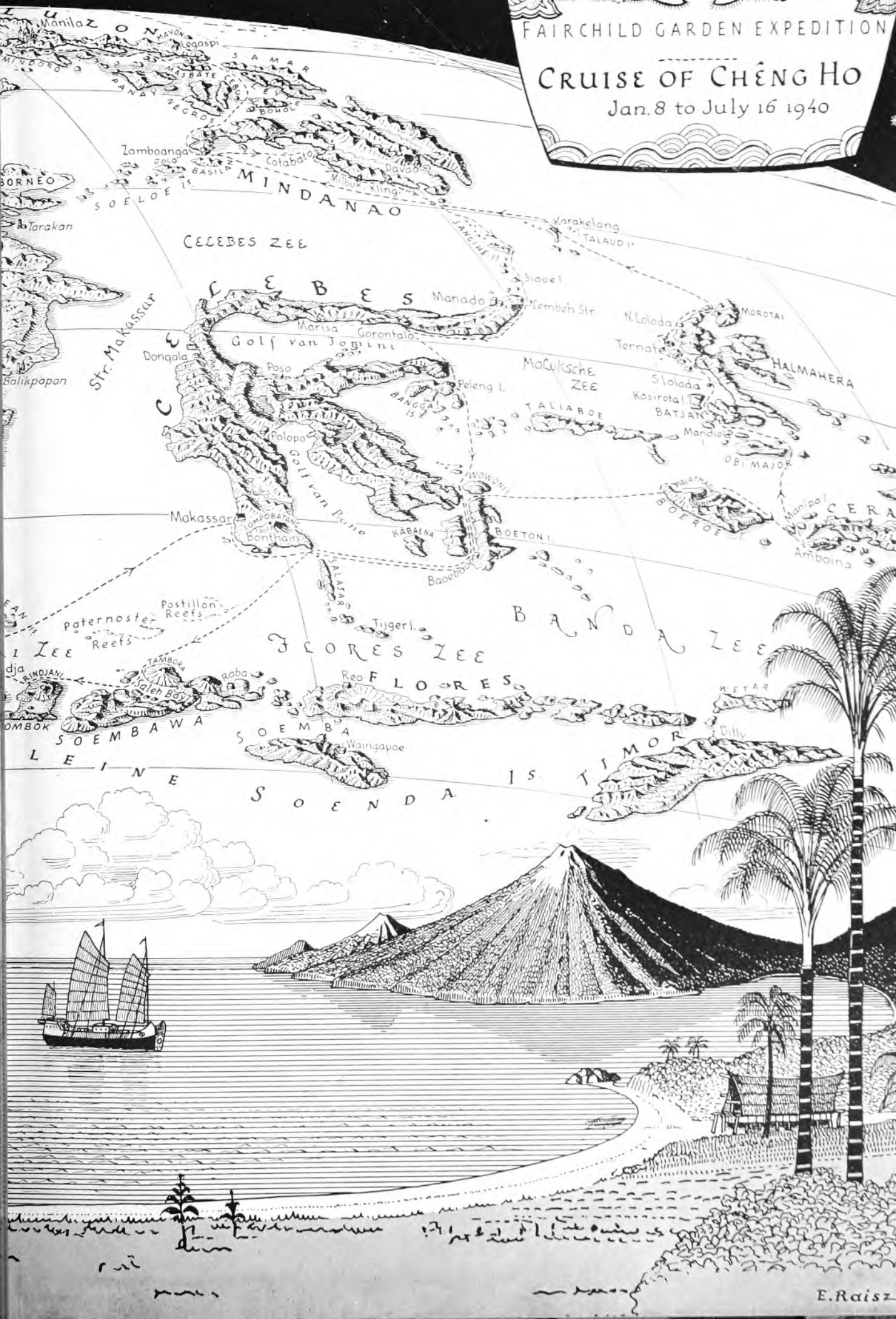




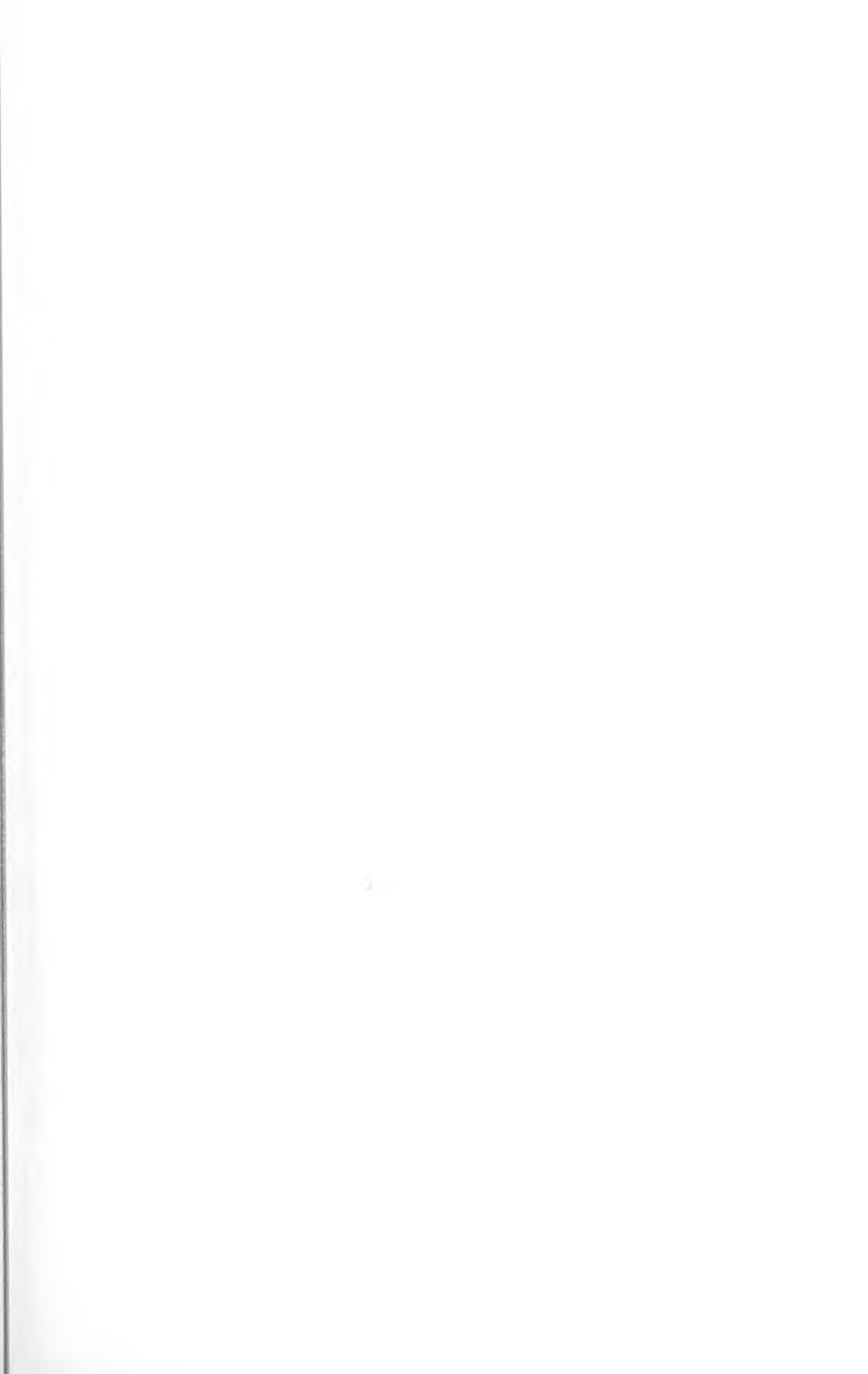
FAIRCHILD GARDEN EXPEDITION

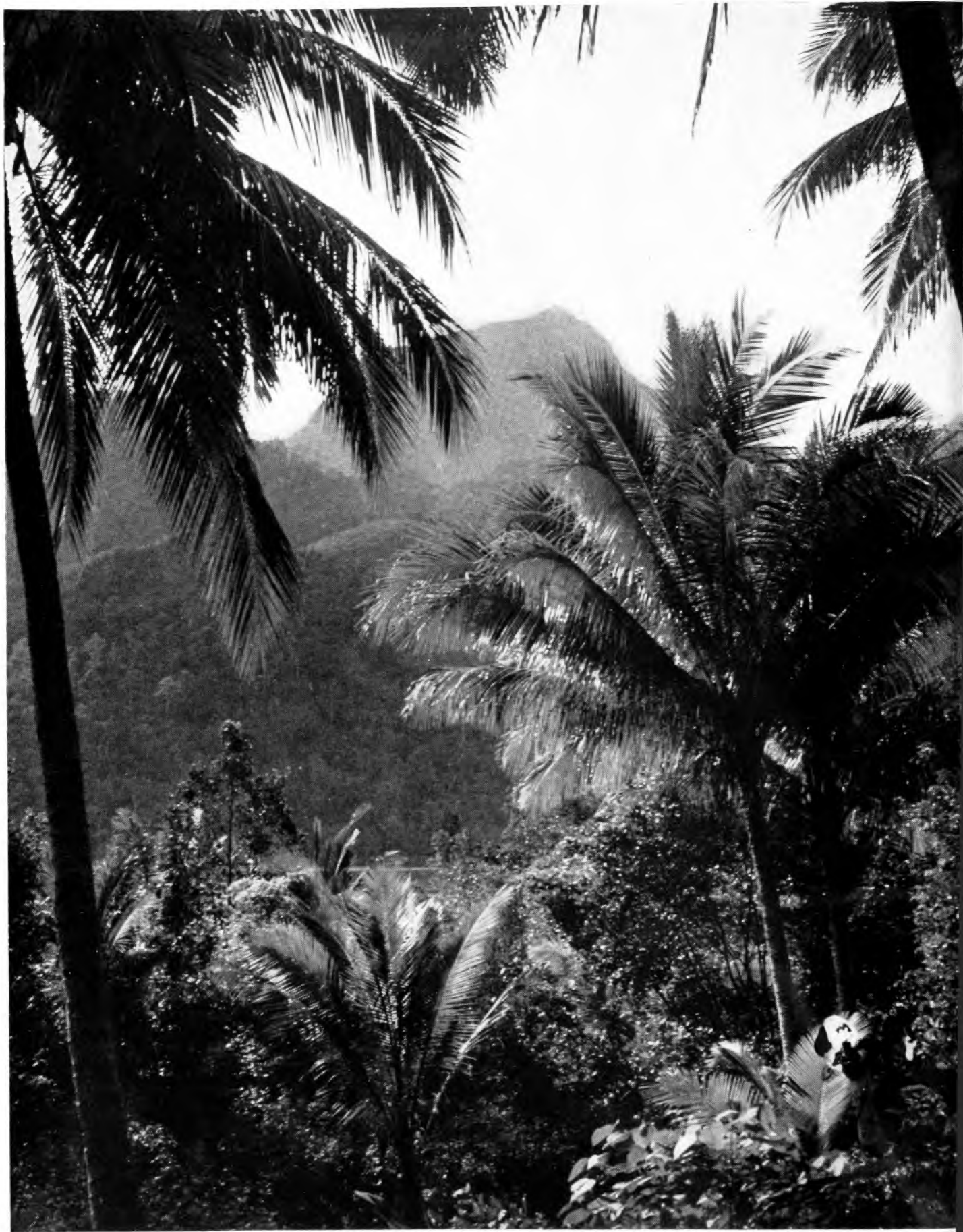
CRUISE OF CHENG HO

Jan. 8 to July 16 1940



GARDEN ISLANDS
OF THE GREAT EAST





In our lives there are moments we would like to prolong, and places we hate to leave. When I had struggled up through the Kogan grass and stood at last on the hilltop on Tengah Island, and saw through the palms Mount Tomahoe on Boeroe Island, beyond the lovely harbor where the Junk lay, I was conscious of such a moment and such a place.

GARDEN ISLANDS OF THE GREAT EAST

*Collecting Seeds from the Philippines
and Netherlands India in the Junk "Chêng Ho"*

By
DAVID FAIRCHILD

Author of "*The World Was My Garden*"



NEW YORK
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1943

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*To those who in the years to come may find
in their gardens some plant which this expe-
dition brought into the Western World.*



Foreword

IT was sometime in the eighties that Alfred Russel Wallace came to the college in Kansas where my father was President and delivered a lecture on Natural Selection. My friend Charles Marlatt had arranged it. I was too young to understand what Wallace said on the platform, but I listened intently to his conversation in our house the evening after the lecture.

I like to imagine that it was this meeting with the great naturalist which started my longing to see, when I grew up, those islands of the Great East—the Malay Archipelago.

It was this desire of mine, I think, which attracted the world traveller Mr. Barbour Lathrop, when we met on a steamer off the Azores in 1894, and led to my going to Java, and later to eight years of wandering with Mr. Lathrop, hunting for plants.

These travels in turn led to my being selected to organize the Office of Plant Introduction and to my spending the best years of my life in introducing useful plants into America—field crops, fruit trees, pasture plants, and ornamentals to beautify the dooryards of the people. The Federal Department of Agriculture gave the opportunity, and loyal associates helped to carry out a work which is still going on, and which has resulted in the introduction of nearly 200,000 named species and varieties of plants from all over the world. These plants have been grown and distributed from Plant Introduction Gardens in California, Maryland, Washington State, Georgia, and Florida. These Gardens proved to be fascinating spots, for in them new plant immigrants made their little beginnings, and from them they went out to create new plant industries.

My early travels in the tropics and, later, my expeditions with Allison Armour on the *Utowana* inclined me towards the possibili-

Foreword

ties of tropical plants in Florida; and into the little Plant Introduction Garden, begun in 1898 in a clearing in a hammock near Miami, I poured a stream of all sorts of tropical species. But it comprised only six acres and was soon filled.

When the first World War closed, I persuaded the then Secretary of War to turn over to the Department of Agriculture, instead of selling it, "Chapman Field"—an abandoned air-training field of some 800 acres. This was a barren waste of rocky white soil and filled-in land, so impregnated with salt that there was scarcely a blade of grass on it. Our introductions, however, since 1923 have transformed it into a garden where thousands of species and varieties of tropical trees, palms, and fruit plants are growing.

Among the people who come into what was once the wilderness of South Florida, there are many who have fallen under the spell of the strange and beautiful tropical plants they have seen here; and their interest has been crystallized recently by Col. Robert H. Montgomery into the Fairchild Tropical Garden with its supporting Association. Already this Garden boasts a collection of about 250 species of palms; a collection of beautiful flowering vines; a Palm Products museum; a choice library. And the Garden Club of America Amphitheatre and the Liberty Hyde Bailey Palm Glade are in the making.

It was to search for new plants to be distributed to plant-lovers through these Gardens that our recent expedition to the islands of the Great East was undertaken. Most of it we made as the guests of Mrs. Anne Archbold on her Chinese Junk, *Chêng Ho*. This book, which Marian Fairchild has helped me to write, is the story of that expedition.

"The Kampong"

Coconut Grove, Florida

June 15th, 1943

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GARDEN ISLANDS
OF THE GREAT EAST

Long Ago in the Great East

WHEN an old man sits under a tree in the twilight and tells us stories of the past, is it not strange how many of his tales remain fixed in our memories? He doubtless gives distorted pictures of many things. He has no charts before him, no "historical" documents, and what he tells has no factual standing, as do the so-called "facts" of science. Yet it seems to be in the nature of our fancy-loving imaginations to take his stories and weave parts of them into our own lives, as a weaver-bird would weave the strips of palm leaves into its nest.

And, after all, what does our imagination do with the facts prepared for us and printed in bold-faced type by more accurate artists? We jumble them up pretty thoroughly in the course of time, and, as we grow older, confuse the pictures anyway.

When I was asked to write a book on our recent expedition to the Dutch East Indies, those wonderful islands of the Great East, I shuddered at the very idea. It is true that we were probably the last Americans to go to such places as Celebes and the Moluccas, before the whole vast region changed hands and was thrown into a condition of chaos. But I thought of the nights and days I should have to spend poring over my notes, and books, and maps, and dictionaries, in an effort to give a "correct" picture of a region which includes several thousand islands and is inhabited by millions of people.

I have come to be shy of such grand expressions as "the Malays,"

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or "the Japanese," or "the Dutch," or any of those vast generalizations which have come to play major rôles in the lives of the common man, to whom a nation of a million walking, talking, human beings—babies, women, and men—is so easily represented by a dozen letters in a row, printed in black ink on a sheet of paper.

How is it possible to give another human being who has never seen a Chinese Junk, or a Makassar prau, or a tropical forest, or even the waving fronds of a coconut palm, a "correct" idea of a host of islands in which these and hundreds of other strange sights make up the landscape picture? Such a thing simply cannot be done. You might as well try to give one who never tasted a Swiss cheese, or any other cheese, an idea of what Gruyère tastes like.

Then I thought of the old man under the tree, spinning yarns from the memories of his past experiences; and there seemed to come before me the circle of friends who sat looking at him and who seemed really interested in what he said. The vision encouraged me. If I might be allowed to tell the story in my own way, relying mostly on my more or less distinct memories, perhaps the picture of the great Netherlands Indies and the Philippines which my readers would get might be not too far from reality to be worth while.

As I sit under a giant Ficus tree on my terrace, the setting sun casts long shadows on the grass, and every now and then a yellow leaf falls to the ground. I see in memory the little red figs lying scattered around under a tree at the entrance to a planter's house far up on the slopes of the volcano Lawoe, in the island of Java, not far from the village of Karang Pandan. Seventeen years ago, Marian and I spent a week-end in a little hotel there, and from the verandah we watched the rain storms come and go, while in the distance the smoking peaks of three volcanoes broke the horizon.

Karang Pandan was a quiet, solitary place which the Sultan of Djokjakarta had chosen for his summer palace. Although the palace was closed, we could see the Sultan's favorite lichee tree in the patio,

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with every bunch of fruits in a little wicker basket that had been woven about it to keep away the flying foxes.

Returning from the palace, we passed a planter's house, and there at the entrance I picked up my ficus fruits. Marian spread out the little fruits on blotting paper, took out the seeds, and we sent them home. This was in 1926.

The next year we built our new house here in Florida and named our place "The Kampong," which signifies in Malay a walled or fenced compound enclosing a group of houses. By this time the seeds from Karang Pandan had grown into small trees, and I planted one of the little things at the corner of the stone wall which holds the terrace. It is under that tree I am sitting now. Its trunk is over four feet through, and like a giant oak it dominates the whole scene. Our daughter Nancy Bell and Marston Bates were married under it and left for Albania shortly afterwards; the Walter Williamsons, young Coconut Grove friends, were married under it a couple of years later; Captain Kilkenny of the *Chêng Ho*, who figures later in this story, was married beneath its branches to the girl he met in Zamboanga. Glenn White, who sits in the Control Tower and directs the planes at the Municipal Air Field of Miami, brought his sweetheart here when she arrived from Indiana, and they were married under our ficus tree the next day.

We have other trees that bind us to the Netherlands Indies. On the same terrace stands the tall *Hernandia* grown from seed which my friend P. H. Dorsett and I picked up in that same year of 1926 on the strand at Sabang, the little island that lies at the North end of Sumatra. As I write, its strange-shaped fruits and golden leaves are falling on the lawn. The fruits have holes through them, allowing one to see the black nuts inside from the ground below. They bring back memories of wonderful days in North Sumatra; in Atcheen, the land of the Atchenese, when we collected a lot of interesting plants, among them Dorsett's wild grapefruit, which he found growing deep in the jungle. An old man-eating tiger was wandering there and its growls made us start a

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bit with apprehension. The grapefruit has never fruited, but I am still hoping that it may, and I never pass it without crushing the highly scented leaves between my fingers and thinking of those days on that high, tropical plateau of "het Bovenland van Noord Sumatra."

Yes, I have seen something of Netherlands India. Into that wonderland of the Orient I wandered first as a youth, a young botanist, in 1895. Enabled to go through the generosity of Barbour Lathrop of Chicago, I stayed there for eight months, studying in the Gardens at Buitenzorg. Sometimes I wonder if, of all the visiting scientists who through the ensuing decades spent months and even years working in those famous Gardens, I am not the only living one who dates his visit back to the nineties.

In those days the visitors were working on subjects which had no direct relation to the increased profits which might be made out of the Dutch-owned plantations of coffee, sugar, tea, and tobacco. These four were the chief plant industries, for "plantation rubber" was yet unknown and cinchona culture was just starting. But I wish to emphasize that, although there was the so-called "Cultuur Tuin," where all sorts of possibilities in the way of cultivated crops were being studied, the Visitor's Laboratory was occupied by students who felt free to tackle anything that their brains formulated as problems. In the imagination of the founders of the Garden, the institution was to discover and bring to light a knowledge of the plant life of the tropical world. Not for the uses of Holland and Netherlands India alone, but for the whole world of plants—a world which knows no national boundaries, a world which constitutes a vast, magnificent realm of living stuff destined to be of interest to the human race for all time, so far as we can see.

Dr. Treub, the Director, was at work on the fertilization of the Balanophoras, strange, parasitic plants without chlorophyll which grew in the mountain forest. I made his microtome slides for him. Janse was tracing the mechanical arrangements of the fibro-

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vascular bundles in the stems of the giant lianas, trying to explain why they could be twisted like ropes, without injuring them; Zimmermann, who later built up an Experiment Station in Amani, German East Africa, was studying the strange cellular inclusions, called crystalloids, that are found in the cells of most plants; and Clotreaux was trying to see if the giant pitcher plants in the Tjibodas forest actually do excrete a protein-splitting enzyme.

Unless one has become fascinated with the behavior of living objects and has learned to watch them, one can hardly comprehend the interest which attaches to such studies as those made in the old laboratory at Buitenzorg in the early days, or evaluate them as most important factors in the development of the Dutch Colonial policy for Netherlands India. As an American, schooled in the more practical doctrines of direct assistance for the American farmer, I had many discussions with the ultra-scientific men who declared they preferred to work on problems having no relation whatever to agriculture.

My own practical excuse for studying, as I did, the mushroom gardens of the termites, was that they were very destructive to houses, doing millions of dollars' worth of damage every year. My studies led me to believe that these social insects, which are blind and live in tunnels, shunning the daylight, and which indulge in savage wars, deserve the most searching investigation by psychologists.

My reason for tarrying in Buitenzorg in this preface to a narrative is to give, if I can, some faint glimpse of the Netherlands India of nearly fifty years ago, at the beginning of the Dutch inauguration of a Department of Agriculture which, when I saw it again in 1940, had become a great affair, with so many bureaus that I felt lost among its multitude of personnel. On that visit of 1940, however, I was pleased to learn that the Botanic Garden, which had been overshadowed by the growth of the Department Bureaus, was to have a new birth. Dr. van Mook, with whom we

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dined one evening in Batavia, explained that the Director, Dr. Bass Becking, had been sent to Holland to secure a staff for the Garden and its Laboratory, with the idea of building up again a laboratory of pure research where the most profound subjects of the day were to be studied by the best minds in the world. Alas, Dr. Bass Becking never came back, for the war broke over Holland. Even before the Japanese invasion, no one in Java knew what had become of him.

I want to stress again that the Buitenzorg Garden which I came to know in 1895 and 1899, in 1926 and again in 1940, has always held an exalted place in my esteem. In those early days, and equally when I saw it last, it was a center of scientific knowledge, an oasis of scientific thought, surrounded by teeming Malay life where ideas above the level of the perfectly obvious could scarcely be expected. For its support of this center, the Netherlands Government deserves the highest praise, and the disintegration of the project can be nothing short of a catastrophe, affecting scientific workers throughout the tropical world.

I cannot help looking back to those early days spent in Java with a longing which amounts to nostalgia, for the place which seemed a fairyland to a youth in his twenties has acquired a halo to the man in his seventies.

To a young man interested in nature it was then about the loveliest spot on the entire globe—a fairyland in which the quiet-voiced Javanese came and went softly. You did not hear their bare feet on the roadways; their batik costumes were the colors of autumn leaves that faded into the landscape; their meals of rice and fish and many kinds of vegetables were eaten noiselessly from wooden bowls, without a clatter of china; their thatched houses of bamboo seemed like playthings scattered picturesquely under the palms and mango-steen trees in the tiny kampongs; and the voices of children playing with crickets on the clean-swept dooryards mingled with the cooing of the turtle doves in bamboo cages which hung from the overarching tips of bamboo poles beside the eaves.

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Pictures crowd in on me. There is one of little two-wheeled carts and fast-trotting ponies taking my "boy" Mario and me over the Pontjack Pass with our petroleum-can collecting boxes and mats, bound for Tjibodas. Afternoon siestas, the first I ever knew. Sitting on the hotel verandah talking botany with Clotreaux, or hearing stories of black panthers from the pioneer cinchona planter of Java. Christmas in a cinchona plantation with the Lotsys, collecting tiny orchids from the limbs of forest trees felled along a rhinoceros trail. Moonlight walks under the giant bamboos, my first experience with these giant grasses. The smell of the durian in the kampong. The soft notes of the bamboo flute player drifting up in the early evenings from Batoe Tulis. Boys and girls playing in the swiftly running stream below the Hotel Bellevue, as the sunset gilded the storm clouds over the volcano Salak and an indescribable green light suffused the whole landscape. The pleasure of learning an Oriental language and practising it on quiet, willing Javanese, who dropped to their heels and took off their great bamboo hats as I passed. Bargaining with coolies who brought strings of mango-steens, twenty in a bunch, and sold them for a "doppletjie," and then stood watching while I learned how to cut or break the fruits open, and the lovely pink cups with their ivory white contents came into sight. My first experience with a falling coconut leaf, which just missed a boy beneath the palm. Telaga Warna, the wishing lake, where I showed Mr. Lathrop and his friends how a section of a liana would drip a glassful of good water into your mouth. The bird-nest cave in the South where Janse took Clotreaux and me, and where the floor of the cave was a solid mass of little mites a foot deep, and enormous, long-legged centipedes stalked on the damp wall overhead, while thousands of swifts, which were building their nests out of thick, opalescent saliva, swirled in the darkness far up in the top of the cave or made their way out into the sunshine.

These memories crowd in as I sit here to tell you what that island of Java was to a youth almost half a century back. I can

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bring back the pictures, but, alas, that Java disappeared long years ago.

I do not say that these things have vanished, but I do feel that wherever Western ways have penetrated they have carried something that disturbs the picturesqueness and quiet of the Javanese civilization, bringing into it crude elements of the machine-made world of which Westerners are proud. How could it be otherwise when great, burly, strong-armed, white-faced people who believe in big cities, shoved back the trees, brushed aside the tiny habitations, and straightened the winding roads? It is all too easy now for any one who has the money to get to town and see a Hollywood movie and gape at the naked legs of the "stars" and at the close-ups of the kissing actors—shocking scenes to the Javanese way of thinking, for they do not parade their sexual behavior in public the way Europeans and Americans do.

The world is growing smaller, but I could not realize then what this shrinking of the world would do to such a paradise. It all seemed so permanent and so thoroughly lovely and quiet, this Java of mine in the nineties.

The only anxiety which, as I recall, crept into that idyllic picture was my feeling that I must find out something—something new—something which would make my stay worth while in the eyes of my patron, Mr. Lathrop, and in the opinion of my envious friends at home in Washington. This followed me even to Tjibodas, the tiny wooden laboratory which Dr. Treub had built in the midst of the virgin forest, high above Buitenzorg.

I had taken nests of different species of termites to the mountains to see if the individuals of one species would recognize others of their own species in a strange place and would refuse to fight with them, but would fight on meeting some other species that occurred near by. To my delight I observed, I thought, that termite warfare seemed to be a *species* warfare, not a *nest* warfare, such as Wheeler had shown the true ant animosities to be, and I wanted to prove it.

I felt that this "discovery" would be appreciated by my patron

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and by my friends, but when I told them of it they passed it by without so much as a question or a sign of interest. The only recognition I ever got out of my termite studies was the hand-clapping of members of the Washington Botanical Society when, years later, I showed them my lantern slides of the fungus gardens cultivated by the termites. These belong to the same group of marvellous social insects whose behavior taught Morton Wheeler so much and turned his interests, I suppose, towards human sociology.

As I sit here forty years later, on the other side of the world, in my own little laboratory under the live oaks, and am deafened every little while by the passing of a swift bombing plane directly overhead, I have a notion that I should have remained in that laboratory on the volcano Gedeh until I found out more about the hates and animosities and wars of those white ants, the termites. I have a suspicion that investigation into their societies and into the so-called "pecking societies" of the domestic fowl and the hierarchies of mice and rats and monkeys, will open the door to a study of this terrible nightmare of hate, vengeance, and prejudice which forms so large a part of the world of the human animal, who, in addition to his manufactured war tools, is provided with the most insidious and deadly instrument of torture and persecution, the thing called language. The poor hen with a short memory who is pecked by all who stand higher than she in the hierarchy of the chicken yard can run away, but the little boy in school has thrown at him the plaguing words which sink deeper into his consciousness and stay there, perhaps for years, to haunt even his dreams.

So perhaps "Uncle Barbour" was not as smart as he thought he was when he said in his positive way, "Fairy, there is nothing in those termites. Leave them alone and come along with me and I will show you the world." It was he who had given me the money to go to Java in the first place and who had now come out to see how his "investment in science," as he called me, was turning out.

His arrival was like an explosion, for it blew the quiet Java I had come to adore into a world of squabbles over hotel porters,

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train schedules, steamboat arrangements, and the whole bustling, superficial mess which is called travel. But, had I had the faintest glimmering that before I died I would fly through the air over the little laboratory in Tjibodas and find ten bombers roaring in practice in the erstwhile sleepy little town of Bandoeng, not far away, the "terribly confused world" of Uncle Barbour, the world traveller, might not have seemed so filled with hurry and worry as it did then.

Up the West coast of Sumatra he took me; to Atjeh, where the unconquered Atchenese were fighting off the Dutch, as they did for half a century, and where some of them still hate a Dutchman. And on to Singapore, then the great emporium and the stopping-place of all through traffic; up to Siam; and back again to Ceylon; and on, on, to Perth in West Australia, then a mining camp; on through monotonous Eucalyptus forests; still on and on to New Zealand and its deathly still forests where the filmy tree ferns grow; and still on, to the Fiji and Samoan islands, and further, to Hawaii. Hawaii was not even a territory in those days. The sugar planters had barely started their large plantations and Liliuokalani was queen. It seemed, when at last we landed in San Francisco, that I had left Java behind me forever.

My father and mother welcomed me back as from some other planet whither I had wandered, and from whose bourne they had scarcely expected me to return.

But, as I have described in *Exploring for Plants* and *The World Was My Garden*, it was only two years later, in 1899, that Uncle Barbour and I found ourselves once more in the harbor of Tandjong Priok, the port of Batavia; this time bound definitely for the islands that lie East of Java, islands which had scarcely been explored or even pacified—Bali, Lombok, Flores, Celebes, Amboina, Banda, the Key Islands, Timor, Ceram, the Aroe Islands, and, lastly, the gigantic island of New Guinea.

This trip, quick and unsatisfactory as it was from a collecting standpoint, further stamped into my consciousness the realization that of all the places in the world which I wanted to see and study

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and collect in, those islands that we had not touched at, and which lay North of our track, offered the most. These were the northern islands of the Moluccas, famed since the days of the great Rumphius, who spent his life on Amboina, writing their flora, and further made famous by Alfred Russel Wallace, whose *Malay Archipelago* recounts his journeys in a native sailing prau to many of the lands which compose this group.

Better known to the general public as the "Spice Islands," some of them were the islands over which sea fights were waged by the then great nations of the earth, the Portuguese, the Spanish, and the Dutch; not because these nations wanted room for their populations, but because on their volcanic slopes there happened to grow two species of trees that furnished condiments with which the ladies of the sixteenth century flavored their meat and other dishes. These were the nutmegs, which, in addition to the nuts, furnished mace from their scarlet arils, and the pretty evergreen trees whose dried flower buds are the cloves of commerce. It is strange that these spices, which many millions of us scarcely use today, should once have been so valuable that in order to get them little sailing vessels no larger than Columbus's caravel should have braved the trip around the stormy Cape of Good Hope, and engaged in life and death struggles with the sailing craft of other nationalities.

When I returned to Washington in 1903 my travel days once more seemed over, and I settled down to the work of building the Office of Plant Introduction in the Department of Agriculture. In 1905 Marian Graham Bell and I were married, and quiet years followed, while our three children were growing up, and the Plant Introduction Gardens in California, Maryland, Florida, North Dakota, Washington, and Georgia were growing up too. Only short trips interrupted the course of office work, but the dream of seeing the Moluccas and of getting plants from them never died. When, one night in 1923, after a dinner on Allison Armour's houseboat

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on the Miami River, Mr. Armour asked me where I would like best to go, provided he equipped a boat for plant exploring, I could think of no other place so likely to furnish the thrills he wanted and the seeds and plants I wanted, as those same islands of the Netherlands Indies—the Moluccas.

But, as was more fully explained in *Exploring for Plants*, our plans, though well laid, went agley; the engines of the yacht *Utowana* blew their cylinder-heads before we reached Naples, and one rainy night Mr. Armour put Marian and me, together with our son Graham, on the *Emil Kirdorf* with tickets for Ceylon, Sumatra, and Java.

Mr. Armour and his sister and brother-in-law, Mr. and Mrs. Francis Whitehouse, were to follow in the *Utowana*, but the local repairs proved inadequate and the yacht never got farther than Aden. Mr. Armour and his party made a quick trip to Ceylon, and arranged for the three of us, who had been joined by Howard Dorsett and his son Jim when they came down from Manchuria, to proceed to Sumatra and Java without them. And the dream of cruising about in the Moluccas faded away.

New Rôle for a Chinese Junk

THE dream never really died, however. I would talk about the islands often, and to friends who I thought could go there if they wanted to, I would suggest that there could scarcely be a more wonderful place for cruising than those varied seas which lie East of Java, between Borneo and New Guinea.

Mrs. Anne Archbold of Washington, whose wide travels have covered much of the globe, came often to Florida, and her love of plants brought us together. She always seemed interested in what I told her about the Moluccas, and talked to me as if she might buy a boat and go out there some day. Once, when I was crossing to Europe, I met a boat builder who offered to prepare plans for her, but they proved much too pretentious.

Then Mrs. Archbold built a house in Nassau, and took great delight in planting the grounds about it. She became even more interested in the idea of a collecting expedition to the Moluccas, and we started in earnest to try to locate somewhere a boat that could be fitted for the purpose. None suitable could be discovered, however, and in the winter of 1938-39 she finally settled on the plan to have Thomas Kilkenny, a friend of her son John, build one for her in Hong Kong.

Kilkenny had built small boats there before, and in one of them had sailed round the world, spending considerable time in the Moluccas. He knew conditions, he knew the capabilities of the Chinese, and he was "crazy" to build a Chinese Junk, equip it with

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diesel engines and so forth, and man it with a Chinese crew. Mrs. Archbold asked him to come to Florida and plan its construction with us, and I was asked to outline the quarters necessary for the seed collector and his outfit, and to make other suggestions. It was most exciting to pore over blueprints of a boat which in the course of a year might be ready to take us through the waters of the Malay Archipelago, which I had almost given up hope of ever seeing again.

Kilkenny turned out to be a delightful and amusing person. He carried us all away with his enthusiasm over the plans, and Marian and I struck up a friendship with him at once, little dreaming how much that friendship would mean to us, or that three years later he would be married under our big ficus tree.

I had seen river Junks on the Yangtse and had a vague idea of what they were like inside, but of the various kinds of sea-going Junks with which the Chinese have for centuries navigated the waters of the Orient, I was profoundly ignorant. I knew that they were flat-bottomed craft, made of heavy timbers, high in the stern, with immense rudders operated by long tillers, and that they had blunt open bows, were broad of beam, and carried from one to several masts with lug sails furnished with battens of bamboo which could be lowered with a bang to the deck. I had heard much of their seaworthiness, but I wondered a good deal whether they rolled and pitched badly in a heavy sea, and how quickly the planks could be dropped in the slots to prevent the waves from coming on board through the opening in the bow from which the anchors were handled. As for their interior arrangements, these baffled my imagination. I thought they must be dark and gloomy, for I had seen few port-holes in their sides.

Such an idea as going to sea in a Chinese Junk had never occurred to me, and it was not until Kilkenny's enthusiasm illuminated the whole picture that Marian and I became committed to the idea and keen about it, even if a trifle doubtful with regard to what we were facing in the way of discomforts and possible dangers. He pointed out how diesel engines would be put in, and

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refrigeration; also adequate fans and an air-conditioned room in the stern. Skylights could be put in the deck, and ventilation provided for. The Junk's greater beam would ensure a degree of stability and a roominess which narrower craft do not possess.

The whole project was to be kept secret even from our intimate friends, but of course it leaked out, and soon we began getting letters of advice against making so dangerous and unnecessary an experiment at our ages, and with "so much that seemed more important waiting to be accomplished at home." Marian and I felt, however, that precisely because we were older the world could spare us more easily if we never came back from the other side of the globe, and I am sure that Marian, at least, secretly enjoyed doing something that her friends thought dangerous! Besides, in our philosophy dangers to health lurk everywhere, and the majority of folk seem to die in their own houses of some accident, perhaps from slipping on the bathroom mat, or from contracting some one of the diseases which spread through civilized society possibly even faster than through the scattered societies of the more primitive world.

Once the die was cast, it was evident that I should have occasion to use all the Dutch and Malay I had ever learned, and, what was even more important, the little knowledge I had of the vast flora of that part of the world, to know which, even superficially, is a lifetime's undertaking. With the aid of my scientific friends, in particular Dr. Thomas Barbour of the Agassiz Museum and Dr. E. D. Merrill of the Arnold Arboretum, I gathered together a tiny working library in various languages for the bookshelves which I had sketched for Kilkenny. They were to be a part of the ten-by-ten laboratory which, it was planned, should perch like a cracker-box amidships on the Junk, immediately over the engine room.

That tiny laboratory was to be equipped with a writing desk, a microscope table, and a drying tunnel furnished with an electric fan for the proper drying of the seeds which would be collected and packed for air transport. We also took herbarium driers, as

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well as presses, alcohol tins, quantities of cotton cloth bags, labels, wax paper, bales of peat moss and sphagnum, and, last but not least, a set of serially numbered accession books in which I could write the descriptions of the plants I found which might be deemed possibilities for cultivation here in Florida. But the most important single item was a stack of several hundred waterproof cellophane bags, each four by eight inches, to keep my seeds at the right degree of moisture on the voyage home by air express.

Like the other expeditions with which I had been connected, this was primarily for the collection of *living* plant material—seeds, cuttings, rooted plants, tubers, etc.; in short, any plant part which would reproduce the desired species in our slat-houses.

"Every child must have a name," and after much discussion, this expedition was named "The Fairchild Garden Expedition." And here it is perhaps appropriate to explain that the Fairchild Tropical Garden was founded in 1938 by Robert H. Montgomery and a group of friends, to exhibit some of the palms, trees, and flowering vines of the tropics of the world. The site, given by Colonel and Mrs. Montgomery, comprises 83 acres in Dade County, Florida, about twelve miles South of Miami and adjoining the Matheson Hammock Park. It was landscaped by W. L. Phillips, well known for his extensive landscape work in the Panama Canal Zone.

In the Montgomery Palmetum of the Garden, over 250 species of palms are beginning to give an idea of the variety and beauty of these "Queens of the Plant Kingdom." In honor of Liberty Hyde Bailey, a Palm Glade is fast taking shape along the shore of a shallow lake. Tropical vines are beautifully displayed over a long pergola, which represents the interest of the late Mrs. John B. Semple.

The Montgomery Palm Museum building was a gift to the Colonel from his business associates, and already contains a unique and interesting little collection of objects made of palm materials, a collection presided over by Mrs. Marion Dall.

A library of Horticulture and Botany was presented to the

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Museum by Mrs. George P. Brett to honor her husband, who first attracted attention to the palms here by planting a collection of them.

The President of the Fairchild Tropical Garden Association, whose members contribute materially to the support of the Garden, is Dr. E. D. Merrill, Director of the Arnold Arboretum. Dr. Thomas Barbour, Director of the Agassiz Museum, has made the Museum his special interest. Nor can I fail to mention Mr. Charles H. Crandon, representing the Dade County Commissioners, who has fostered the project in every way possible, in so far as the activities of the Garden dovetail in to the Dade County Park System.

It was with great reluctance that I consented to have the Garden bear my name, for so many other personalities have contributed to its creation whose names are not mentioned. But under any name it is a Garden to be proud of—one of those things of natural beauty on which our æsthetic natures feed, and without which there can hardly be a high civilization. It is a world of beautiful imagination and peace.

In my album I have a photograph of Mrs. Archbold, Marian, and myself in the spring of '39 standing in the Garden, which was then two years old. The occasion was the eleventh annual picnic of the Florida Gardeners' Association, and we were posed in the midst of the party as its distinguished guests. But none of them knew then that we were planning to make an expedition after seeds and plants with which, as the years passed, they would probably be working, distributing them to the gardens and patios of the residents of the whole South Florida region.

It was in part the memory of this occasion which kept fresh before me the object of the expedition and, during the months that followed, prevented me from devoting myself to getting data when I should be getting seeds. It perhaps helped to form the philosophy of life—if it deserves so high-sounding a name—which guided me through those months and which is active still. It is this: At seventy, what one collects in the shape of opinions and so-called "data," "facts," and "figures," has a rather small chance of being

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passed on to others, a small chance of "doing some good," as the saying goes; whereas what one collects in the shape of seeds and plants has a very good chance of growing and becoming something worth while to somebody long after the shadows fall.

We Journey into a World at War

THE weeks flew by. My pile of books and paraphernalia grew, and the wires and telephone calls that antedate a departure became more and more confusing. But at last the trunks and bags were packed and locked and sent to San Pedro, California, addressed to the freighter *Laura Maersk* of the Isbrantzen Moller Line, due to sail September 11, 1939, for Yokohama, Kobe, Shanghai, Hong Kong, and Manila. And at last we had time to catch our breath.

In Baddeck, Cape Breton Island, Nova Scotia, is "Beinn Bhreagh," where Mr. and Mrs. Alexander Graham Bell spent many years of their lives and on whose mountaintop, overlooking the beautiful Bras d'Or Lakes, they lie buried. It might almost be called an ancestral home, for their children and grandchildren and great-grandchildren all love its spruce and fir forests and picturesque rocky shores. There Mrs. Gilbert Grosvenor and Marian, Mr. and Mrs. Bell's two daughters, gather their children and grandchildren around them in the summer, and there, on a spit of land in the harbor, I have a little laboratory which is the quietest, most restful spot on earth to me, with its books and microscope tables and photographs. It overlooks the historic place where the first flight in the British Empire in a heavier-than-air flying machine was made by our friend J. A. Douglas McCurdy in 1908.

Marian and I felt that we could not go to the other side of the world without seeing that home once more. So on July 15th, we

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pulled out of The Kampong in our Ford car for the 3,000 mile trek North. We stopped over in Washington for a last conference with Mrs. Archbold, who was leaving for Hong Kong to oversee the finishing of the Junk. We also wanted to make arrangements with our executors, so that, should we not return from the Great East, too much confusion would not ensue.

At dinner in Washington one night, Miss Polly Randolph offered to write Admiral Thomas C. Hart, asking him to look out for us when we got off among "his" islands. Knowing that letters do not always get written, I whipped out my little red notebook, and she scribbled a note to the Admiral on one of its pages. Admiral Hart got the note.

A few hectic days in New York and a few more in Boston, conferring with Dr. Merrill and Dr. Barbour; a few lovely weeks in Baddeck, and it was time to start on the great adventure. Dr. Grosvenor took all of our two families in his boat, the *Elsie*, to Shenacadie, on the far side of the lake, where the train would stop for us. We had a last picnic around a bonfire on the strand. I can still hear the whistle of the train as it rounded the curve of the shore before being stopped by our flag, and see the girls as they skipped along beside the slowly moving train for a last sight of us, waving their sweaters high above their heads and singing "Aloha" as we disappeared into the darkness.

The last bridge was burned. We had taken farewells of our family before, but this one was different. They knew the small size of the Junk, and the far-off tropical seas that we were to sail were hard to imagine as anything but dangerous. And the possibility of war was in every one's mind. Neither our family nor we had the remotest idea that in exactly one year to the day we would arrive back in Baddeck where we started from, and would take up our lives there as if we had not been away.

I am aware that the emphasis I put on this fact will strike the generation of "bird people" which is growing up as curiously trivial, but I am recounting it because it marks, perhaps, the end of the

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era of train and steamer travel. Even so short a time ago as 1939 it was a serious matter to go away to the ends of the earth, to Java and Celebes and the far-off Moluccas. Yesterday I talked with a man who had come that morning from Saint Vincent, in the West Indies, to see his family here for a few days; he was leaving Tuesday for Australia, where he would arrive in less than a week.

We crossed the continent to Los Angeles. It was while we were in Utah, passing through regions that were growing Feterita, a forage crop I had the pleasure of introducing from Egypt in 1900, that the radio in the observation car brought through space the voice of Prime Minister Chamberlain declaring war on Germany. My thoughts went back twenty-three years. "What is war, Mummy, something people stand on?" My little daughter of four had that idea of war in 1916, and I wondered, as we listened there in the swiftly moving train that fateful September morning, if we had now any clearer idea than Nancy Bell had then of what war was to mean to the world—"total" war.

Those few days in Los Angeles, when we had to make the decision to go ahead or turn back, have left with us the kind of a memory that a nightmare sometimes does. But the Japanese had not shown any disposition to start war in the Pacific; travellers were passing through Japan and Hong Kong, and Manila was still American territory. The war was on in China, it is true, but that need not affect things in the Netherlands Indies. If the war did spread it probably would be a long time before there would be another chance to get plants from that part of the world.

We decided to go on.

Typhoon on a Cargo Boat

THE *Laura Maersk* was a Danish cargo boat, and we soon found that getting aboard a freighter is not at all like getting on a luxury liner. We picked our way across the pier, past piles of lumber and around barrels, with no one to meet us and carry our grips or to show the slightest interest in our doings. We had clambered up the gangway and traversed the deck before we routed out any one to help us. But, although there are many more luxurious ways of travelling than on a freighter, we have found none that seemed more comfortable or that made for a more agreeable voyage.

Of the typhoon which struck us just before we reached Japan, Marian wrote in full to the children. Although many travellers who have crossed the Pacific have been in typhoons, these storms are such a characteristic feature of the life in that part of the world and have so much in common with our Florida hurricanes that her detailed description cannot fail to interest our Florida readers. The letter was sent from Japan but was written on the boat.

"I am rather ashamed of myself for sending such depressed letters to you just at sailing, but the fact of the matter is that I *was* depressed—horribly so. With the radio in the hotel lobby blaring out the war news flashes every half hour, and my natural sadness at going so far away, and with the uncertainty as to what we were running into in the Orient, I couldn't get up much enthusiasm for the trip.

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"However, I am glad that we stuck to our plan and came. Our other passengers are Dr. and Mrs. Collins, going back to Shanghai with their nine-year-old daughter Martha; Mr. Zitkowski, returning to his position as chemist on a sugar plantation near Manila; and Alice Colbath, going to her sister's in Manila. The Captain is the only one who seems worried. There was a report several days ago that Hitler was planning to take over Denmark. Dr. Collins refuses to worry over the report that the Japanese have given Great Britain a month in which to get her troops out of Shanghai. Mrs. Collins will not listen to the radio. She says that it will not take more than an hour after landing to change their plans, so she refuses to get stirred up. She has been evacuated once, and they realize that if troops should be withdrawn the position of all foreigners would probably be disagreeable.

"Off the coast of Japan we ran straight through a typhoon of considerable intensity. Two Florida hurricanes had visited The Kampong but never while we were at home and I was curious to experience one, even at sea.

"At five o'clock, when we were all together in the lounge, the Captain came in, sat down, and said quietly, 'We are running into a typhoon. I have just got definite news. You must all go down to your cabins and put everything away that is likely to fall off. You had better even take the bottles out of the cabinets over your wash-stands.' I can't give you any idea how curiously bizarre the whole thing seemed, perhaps all the more dramatic because the Captain was so quiet about it. 'Are you going to alter your course?' we asked. 'Oh no. We will probably go through the center of it, but it will be all right.'

"We dine at six, and by that time it was noticeably rougher. All her soup and three glasses of water landed in Alice's lap and Mr. Zit slid almost off his chair during one big roll. None of the Collinses came down. After dinner we could see through the dusk and the flying spray that the men were bringing in the gangplank they had ready for landing in Japan, and snugging up everything.

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"It got worse with astonishing rapidity. The radio antennae blew off, the cargo began to shift, so the Captain headed into the wind to enable the men to go down and straighten things up as well as they could. That brought the full force of the wind and blinding sheets of rain and spray against the lounge doors where we sat, and they began to ooze water till the floors were awash. Just before this, while we were headed with the wind more on our side and the doors were still open and rain and spray were blowing by, and while we could hear the curious howling of the wind that Barbara speaks of in Florida, we heard, mingled with all these sounds, some terrible, moaning cries. Lee, our nice cabin boy, a Johns Hopkins student out on his first cruise, had catapulted across the deck and landed with his head against an iron brace. He was unconscious but moaning horribly, and the water was sloshing over him and his head was bleeding. It was very grim. Fortunately it did not turn out to be serious.

"In the meantime, as I have said, it got worse and worse; every chair that wasn't fastened down fell over; the inside men were mopping up the floors; the Chief Officer and Steward tried to fasten canvas over the doors, but they gave it up as a bad job. With every extra lurch of the ship you could hear crashes from below. From time to time the First Officer would come in, his wet shirt clinging to his body, his rubber boots full of water. 'How's the barometer now?' was our first question. He would point to the deck with his thumb. 'Still going down,' he would say. Mrs. Collins was horribly frightened but I don't think the rest of us were; we were too excited to be frightened or to be seasick. Daddy kept spurring every one on to tell a story; and all of us laughed hysterically at the least funny incident, and there were many.

"Two or three times a wave hit the boat with such a stunning blow that she stopped and quivered all over, and my heart missed a beat or two over that, but really this is such a grand ship and the officers so steady and calm that we couldn't feel there was danger, unless the engine had broken down or something like that hap-

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pened. I liked too to know that we weren't being treated like children; the officers told us what was going on, but it was so obviously all in a day's work, thoroughly unpleasant and an awful lot of extra work, but no more than that, that it gave us complete confidence. At last, about a quarter to eleven the First Officer blew in again. 'The barometer is steady now,' he said, 'the worst is over.' A little later the Captain came in to tell us the same thing. 'It was a severe typhoon, and there will be a lot of motion for several hours more, but we are getting out of it and the barometer is going up.'

"In an hour or so Daddy and I ventured down to our cabin and got some rest. Not so very much sleep with such incessant rolling and an occasional pitch and lurch and twist that would make us grab the side of the dresser to keep from falling out. We didn't venture to undress until along about dawn when things were quieter.

"The Captain does not think the typhoon touched any land, so there was probably no word of it in the papers to worry you over the fate of your parents. You must give me a good mark for never once saying, last night, 'Well, we always *said* we hoped we'd go down at sea together sometime.' I thought of it but was glad to believe that we weren't to do it this trip."

Bread cast upon the waters seventeen years earlier returned to me aboard the *Laura Maersk*. Captain Andreasen set an excellent table and carried California fruits. One morning I was telling him of our Florida fruits and mentioned the Haden mango. "We have that fruit on board," he quietly remarked. "Would you like some?" When the steward set before us some beautiful Hadens I could scarcely believe my eyes. "We picked them up on our way through the Panama Canal," the Captain said. "There is a grove of these bright-colored mangos on a little island in Gatun Lake. A man by the name of White owns it."

A memory flashed through my mind, a memory of 1922 when my old friend Dorsett and my son Graham and I took some cases

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of plants down to Panama and helped inaugurate the Plant Introduction Garden, now called Summit Garden. Among the plant materials were some bud-sticks of the Haden mango, which is the most brilliant of all the mangos I have yet seen. Through the barber at the Tivoli Hotel, I learned that there was a Mr. White who took a great interest in plants and had a place on the hill above the hotel. I went to see him, and that visit resulted in our budding some seedling mangos with our Haden bud-sticks. I had heard through friends that White had gone ahead and made an orchard somewhere in the Canal Zone, but these mangos before me on the *Laura Maersk* in the middle of the Pacific were the first positive evidence I had seen that he had been successful. And now, quite recently, I hear that White is dead and the mangos have been torn out because they stood in the way of certain improvements.

Our five fellow passengers, having all lived in the East before, were able to tell us stories and give us information that would be of use to us later.

"Have you ever tasted a 'belout,' Dr. Fairchild?" asked Mr. Zitkowski one day. I thought I knew a good deal about foods, but I had never heard of this one. Then he explained that it was a half-hatched duck egg, boiled and served in the shell. He did not call it "perfectly delicious," but he did maintain that it was considered a great delicacy by the Filipinos of Luzon, and he promised us some if we would visit him at Tarlac. Weeks later, when we were on Luzon, we accepted his invitation. Although I found the yolk of the half-hatched duckling as delicate as Camembert cheese, the pin-feathers and tiny yellow feet disturbed me, do what I could to quell a rising aversion for what is a real delicacy to others. Aversion, it occurs to me, deserves much more study than it has ever had—aversion to foods and various objects as well as to people and races. Such a study might shed some light on the whole terrible phenomenon of prejudice, that emotional something which lies at the bottom of our social behavior and out of which the bitterest animosities arise.

Glimpses of a Vanishing Japan

AS the *Laura Maersk* neared the coast of Japan, I realized that the Yokohama we were approaching could not be the same city in which I had spent such happy days at the Grand Hotel, for the Yokohama of those memories had been almost destroyed by an earthquake. In those years my friend Mrs. Nellie Howard lived on the Bund and at her house I met Admiral Rogers and "Fighting Bob" Evans of the Asiatic Fleet. I spent much of my time going back and forth to the Yokohama Nursery Co. arranging with Mr. Suzuki for the shipment of bamboos, today represented by groves in Louisiana and Georgia.

Most of the single day that we spent in the Yokohama of 1939 we devoted to those same nurseries, which are still running and still as spotless as ever, with pretty blue and green pottery trays instead of the ugly rough wooden "flats" we use for growing seedlings in.

Mr. Suzuki gave us his whole afternoon, and took us for a thirty-mile drive, although his monthly gas allowance was only ten gallons. He took us out to his field nursery and told us with a good deal of feeling about his discouraging efforts to save the finest varieties of flowering cherry trees of the once famous Arakawa collection. I gathered from the conversation that the interest in those lovely creations of the gardeners of the old Daimios, or feudal lords, which had been cherished through the centuries, now was fading; that street improvements were destroying the collection. And when, in the grounds around the temple at Kamakura, I saw

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new plantings of the large, coarse-leaved European plane tree, a tree completely out of scale with those choice native trees which have for centuries set off that magnificent statue of Buddha, I felt as badly as he did. But what's the use? As in other countries, so in Japan; the politicians have control, and apparently no longer take advice from the masters of landscape gardening.

Although Marian had seen the temples of Nikko when, as a girl, she visited Japan with her parents, I had never seen them. So, with Alice Colbath, we took an early morning train out of Yokohama, forgetting that we spoke no Japanese and that the train would be filled with people who could not understand us. A foreigner on the subway in New York must have something of the same feeling that we had—a sense of helplessness. The cars were crowded with boys and girls on their way to school, and businessmen and workmen going to their work. A few passengers stared fixedly at us, but most of them were quite as polite as the passengers on the subway.

I had read so much about the great *Cryptomeria* trees leading up to the temples and about the famous red lacquer bridge that the "maximum expectations" I had formed let me down, for reality never comes up to exaggerated anticipation. I found that the setting of the bridge had not been protected; a street-car ran so close to it that its beauty was marred. I resented also finding that telephone poles had been stuck along the avenue of magnificent *cryptomerias*, destroying the sense of sacredness and beauty.

But the temples were amazing, and the old trees which set them off helped create an atmosphere whose appeal few of the hundreds of pilgrims going up and down the long stairways could possibly resist. As I climbed the endless stone steps to the magnificent tomb of Iyeyasu, up through the *cryptomerias* planted five hundred years ago, I found myself thinking of Noguchi and Hirase and Takamine, and of other Japanese scientists I had known, and of their gifts of knowledge to the world. And I wondered what Japan's ideals might have been had monuments such as this been built to honor her

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men of science, her discoverers, rather than to extol her military heroes.

We were so exhausted and lame from all our walking and climbing that we could hardly drag ourselves back to our hotel, a typical Japanese inn. I had forgotten how simple life can be in a wooden house with broad verandahs, with noiseless, sliding, paper-covered screens for walls, with charcoal fires in lacquer boxes, and padded mats to sit and dine and sleep on—and, best of all, a hot-water bath to cook all the tiredness out of your body at the close of day.

Our verandah looked off across a little valley to a school, where we watched the children going through their vigorous military exercises—tiny little things training for the strenuous life. At nightfall we saw the girls in the house opposite bring out the bedrolls and throw them on the floor, and in a few minutes everybody in the house was lying prone and asleep, where half an hour before they had been sitting at work. The life in Japan is simple, not to say bare and uncomfortable, compared to ours. It is not difficult to understand how much easier it is to turn it into a way of war than it is to convert ours into one.

Next morning the train took us through the rolling country, down to Tokyo and Kyoto, and I sat at the window looking closely at the passing fields, for in 1902 I had spent some time studying the vegetables and grains grown in this country. Some of their staples have become major crops in America today. Soy beans and Japanese varieties of rice now cover millions of acres in the Middle West and California, and small groves of the Japanese bamboo are beginning to enrich the landscape of our Southeastern states.

As the interminable fields swept by me, I began looking for those weedy, uncultivated areas that are common in our country. There were none. Like highly cultivated vegetable gardens the fields abutted on one another, and in them was quite a variety of food plants. There was no corn, however, no wheat or barley or oats or rye; no white potatoes or carrots, no beets or cabbages of

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the European sort. There were fields of buckwheat, soy beans, okra, sweet potatoes, broom corn, hemp, ramie, udo (*Aralia cordata*), mitsuba (*Cryptotenian canadensis*), bamboos grown for their edible shoots, and here and there some patches of pe-tsai, the celery cabbage. Paulownia trees, mulberry plantations, kakis, or persimmon trees, together with cryptomerias and thuyas and willows, completed the landscape and may, perhaps, be taken as typical of the region around Nikko.

Like the language, which almost no Americans have mastered, the foods of Japan for the most part have remained strange to us. Only in recent years have we appreciated the superiority, in some respects, of the soy bean over Indian corn as a field crop, largely because of the valuable oil, vitamins, and proteins it contains. Our crop in 1941, grown mainly in the Midwestern States, was 107 million bushels, and the vast storage houses and great processing factories now to be seen there are evidences of the swiftly changing agriculture resulting from the adoption of the soy bean as a field crop.

As I write these lines, a glass of acidophilus soy-bean milk is furnishing part of the energy that enables me to finger the keys of my typewriter. Strangely enough, although I have been drinking it regularly for several years, I doubt if it is known to many Japanese. It is an American invention, one of Dr. John Harvey Kellogg's.

As the train progressed South, we came to the munition factory district outside of Kyoto. In the gathering dusk, we saw the lights streaming from the open doors of machine shops everywhere, and I was struck again by the insanity of making things to kill other human beings.

When I had been in Japan before, I had met some of the Japanese who had been among the first students to visit America and bring back Western ideas. Two of my Kansas college professors had gone to Japan to help the Government organize its agricultural schools. Now we were to visit in Kyoto at the Doshisha, a school inaugurated by an American woman for the education of Japanese

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girls, and we were to stop in her house near the school. For Miss Florence Denton, who met us at the station, was a friend of Marian's family, the friendship dating from the time of their visit to Japan in the nineties.

Miss Denton maintained a little international center, where visiting Americans could meet the coterie of Japanese friends she had gathered about her, and where her students and professors were always welcome. The sincere work she had done for the girls during more than fifty years, and her large-hearted hospitality and wide sympathies, had won the respect and affection of many of the most prominent residents of Kyoto, who showed us courtesies for her sake.

It was an extraordinary house, where almost anything from dried botanical specimens and bird skeletons to bits of ancient Japanese works of art could be seen lying about. "I want you to see the heart of Japan," Miss Denton said, as her Japanese companion showed us to our room, carrying in her hand a tiny bamboo cage in which was one of those singing wood crickets so beautifully described by Lafcadio Hearn in his *Kusa Hibari*. As we made our way through the labyrinth of objects which our hostess could not bear to throw away, the tiny cricket began to sing, and through the night, whenever I was awake, I heard its delicate song.

As the window of our room was thrown open, there, on an outside balcony, in the pale moonlight, were the offerings to the Harvest Moon—a variety of fresh vegetables and fruits as prescribed by long usage and arranged according to the ancient custom. Every household in the old days made such offerings, and we had happened to arrive on the 25th of September, just at the time of the full moon.

It seemed to me completely out of accord with the growing spirit of militarism which we saw the next day reflected in the writing books of the girls. Over and over again they were copying: "Remembering the hardships of our soldiers at the front I will work hard at the Doshisha."

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The school had an auditorium, which, I believe, had been built with money contributed by Americans, Arthur Curtiss James among them. When Miss Denton announced that I was to address the three hundred girls there, I didn't know what to do, for already the tide of disapproval of the doings of the Japanese war party had begun to rise high in America. But we were not at war with Japan, and certain of our college professors were not yet denouncing the whole race and advising their extermination, as they since have done.

As I stood on the rostrum and faced those girls, every one of them with jet black hair, cut alike, and with piercing black eyes, the only thing I could think of to say to them was that gifts of courtesy, such as that of the cherry trees presented to Washington by the Mayor of Tokyo, spoke louder than words; for words were easily misunderstood. Alas, how little I dreamed, as I stood there, of the depths of hate and the insensibility to cruelty which lie below the surface in most of us, to be disclosed once the forces of prejudice and fear produced by lying threats, those tools of war, have roused an almost paranoic beast within the human animal, and he becomes fanatically insane.

I was eager to see once more before it vanishes the famous landscape gardening around the Ginkakuji temple, where there reigns a quiet that might well be the quiet of a dream. Faultless of their kind, with every detail worked out and planned for, I could not but admire the pictures I saw on every side when I made my hands into a frame and viewed each corner of the garden. But long residence in tropical regions, including South Florida, where I have about me tall palms and giant rubber trees, has changed my taste for rock gardening and miniature landscapes, I fear, though I once loved them as many others do.

It was forty years since I had been in Kyoto and I wanted to see what the lapse of so long a period of time had done to that most famous of cherry-blossom trees, the "Shidare Sakura," which covered almost a whole square with its drooping delicate branches.



It seems a monstrous crime to fill such heads as these with dreams of national conquest through dishonesty, brutality, and assassination. *At right:* Miss Denton, who has spent her life trying to inculcate sane ideas into the minds of her pupils, says good-bye to us.



Growing in the dense rain forest behind Milbuk, in Mindanao (page 86), are immense trees of *Eucalyptus philippinensis*, a species which deserves trial in other rainy tropical regions.



I think I never saw a fruit tree more heavily laden than this *Antidesma* tree in Laguna, in the Philippines. It is the one from which my tree on The Kampong came.



To most animals a bath is optional, but to a Carabao it is essential, as necessary as sleep—for it has no sweat glands.

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In spring it was one of the sights of Japan. Trees of the same variety which I had planted on our place "In the Woods," in Maryland, have grown into giants, and seedlings from them, scattered by the birds, are springing up among the oaks and beeches there. I found the great tree slowly dying, but only after a lifetime of giving pleasure to countless thousands through the centuries.

One afternoon we drove out with Prof. Morikawa beyond the nondescript suburbs of the modern industrialized city until we struck the Japan that I had known forty years before. In the soft light of early autumn the rice fields were yellowing for the harvest. We stopped at a little house where the whole family was busy making tiny toys out of pine cones and bits of bamboo, imaginative things, all fashioned by hand and exquisitely done. Then we went on to the "Cottage of the Falling Persimmon," where one of Japan's poets used to live and where we caught again a glimpse of the Japan that used to be. In the small garden a woman was sitting, busy over something with her brush and paper, and we asked Mr. Morikawa what she was doing. He said she had been copying some characters engraved on a large stone in the garden, but she was now composing a poem. Although it is almost impossible to translate from Japanese into English, what we made of Mr. Morikawa's translation fitted so completely into the autumn landscape that I give it here:

Ripening rice fields outside
Visitors from afar
Come to the little cottage
Of the falling persimmon
Former home of Kyora
The famous Japanese poet.

I am conscious as I write this account of our visit to Japan that my readers, who are thinking of the Japanese soldiers of 1943, may throw my book down without stopping to reflect that the events

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I am describing occurred in 1939, more than two years before the attack on Pearl Harbor and the horrors that have followed. And even then we were thankful that we could be "insulated" from the war atmosphere by Miss Denton and her faithful Japanese friends, who guided us about during our three days in Kyoto. Of Miss Denton there has been no word since war broke out, and we can only hope she has not lived to be disillusioned about the land to which she gave all her working life.

On the train to Kobe a Spaniard and his wife and daughter were in our compartment, and falling into conversation with them, I learned that they lived in Manila. Now on the list of plants that I especially wanted to get from the Philippines was a variety of coconut called the "makapuno," which has no cavity inside, but in its place a mass of soft, gelatinous, white meat which I had heard was much in demand by the ice-cream makers of Manila. We had imported some of the nuts the year before, and Mr. Hugh Matheson is growing them on his plantation at Key Biscayne, near Miami. But none of us knew what the ice-cream tasted like. I asked our Spanish acquaintances if they knew of makapuno ice-cream.

"Go straight to the Selecta Restaurant when you get to Manila, and there you can get it and other sorts of ices too," said the daughter. And one of the first things I did when we were settled in the Manila Hotel was to take the young lady's advice. The show of tropical ices at the Selecta was the largest and most varied I ever saw anywhere. The cream from the milk of the carabaos was used in some; also the ground root of the purple yam, among other things. But the best of them all was the makapuno ice-cream, a most delicate and delicious dish, comparing in flavor and texture with the best "guanabana" ice-cream to be had in the fashionable restaurants in Havana. May Hugh Matheson's makapunos soon fruit!

Arrived in Kobe, we had a time of it getting across the city and finding the *Laura Maersk* among the dozens of other vessels in the

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bay. But we managed and soon we were crossing the China Sea to Shanghai.

As we neared China, long before the coast came into view we began to see lone Chinese fishermen here and there, out of sight of each other, each standing on a tiny raft, working his long oar-sweep back and forth to propel his frail craft against the stiff breeze which drove the waves over it constantly, seeming to threaten to wreck it any moment. The vivid picture of those solitary souls struggling against the sea for a few cents worth of fish, and the swarming thousands of half-starved men and women on land, fighting for a chance to earn a single "cash" for an extra bite of food, keep recurring to my mind and raising again the question which nobody seems able to answer: "Why so many people in the world anyway?"

For years I had heard of a Chinese restaurant in Shanghai which challenged the world in the variety and excellence of its delicacies. We found most of them so different from our Occidental dishes that my friends of the Middle West who prefer such things as "Pie à la mode" or "Ham and eggs" or a "T-bone steak with French fried potatoes" would, I fear, leave the table hungry.

The names on the bill of fare discouraged Miss Colbath, our fellow traveller of the *Laura Maersk*. How could anything edible be made out of a bird's nest? I don't know that I helped matters by telling her it was made of the clear, translucent saliva of a species of swallow. Yet it ranks at the top of the Chinese menu. With the exchange so low that an American dollar was worth thirteen dollars Shanghai, we took our choice of everything we wanted to taste on the long bill of fare for forty cents a person, and we discovered many most delicate and delicious dishes. I went away more than ever aware of the vagaries of the human palate, around which gather incredible prejudices that arouse all sorts of animosities, such as that of the British soldier a century ago for the Frenchman who ate frogs-legs. Perhaps the study of prejudice ought to start at the dining table. Certain it is that food prejudice begins early, for a

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tiny baby refuses to accept without remonstrance a change in the milk formula for its bottle.

The dock in Shanghai was in the Japanese quarter, and every one insisted we must not go through it late at night; so, very regretfully, we got aboard for a six-thirty dinner. Then we had a restless night, for the paint was being chipped off the iron deck. Four hundred coolies had been at the job from the moment we landed, and although most of them stopped fairly early, some of the fiendish hammering went on until 5 a.m., when we sailed. The coolies, working twenty-four hours and more at a stretch on a rush job, as they do at many Japanese and Chinese ports, take a few moments off now and then for a bowl of rice and to catch a wink of sleep, and then they are up and at it again. It cost only \$60.00 American to have the paint taken off the deck. Our cargo, which had cost \$1.50 a ton to load in San Pedro, California, was unloaded for fifteen cents a ton in Yokohama, the Captain said.

Mrs. Archbold had preceded us to Hong Kong by several months to plan the decoration of her Junk in classic Chinese style. She had decided, she wrote us, to name it after Chêng Ho, a famous Chinese admiral. She met us at the dock and took us to Ah King's Slipway, where Kilkenny and his nephew, Fenton, were supervising its building.

We could not see the Junk very well under the low shed roof, but Marian and I looked at each other and shuddered a bit when we saw what a tiny craft she was, and imagined the giant combers that might easily sweep over her. Neither of us had ever been to sea in anything smaller than Mr. Armour's yacht *Utowana*, which seemed a leviathan in comparison with the Junk. She was only 106 feet long, with 24-foot beam, and drew 12 feet of water. Other facts about her were reassuring. Her twin diesel engines developed 110 H.P., she could make 8 knots under power, had a cruising radius of 5000 miles, and could carry 3000 gallons of drinking water.

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Mrs. Archbold drove us over the roadways of the island, and nothing could have been more picturesque than the little bays and villa-covered hillsides of Hong Kong on that perfect, sunlit afternoon. Dr. Herklots of the University came to dinner, and when he told about the interesting plants growing on Hong Kong I was almost persuaded to stay over and botanize with him, for there are many plants that should be introduced into Florida from that little island.

I hunted in vain through the only market we had time to visit for some of the edible acorns I had found in the fruit shops forty years before and had successfully introduced into Georgia and Mississippi. Trees of this *Lithocarpus cornea* have fruited already in America.

After sunset we wandered about the streets, crowded with refugees. Whole families slept on the bare sidewalks, and thousands of pairs of eyes stared at us from all sides. Those eyes made us wonder what it is all about, this mass of living human material—and made me wish there was less of it and that it was spread out instead of being heaped up, as it was there.

We sailed that night for Manila. I had a picture in my mind of Manila, but it was forty years old, and just about as useful as the baby picture of a forty-year-old woman would be. I once got into difficulty by trying to get out of meeting a middle-aged lady with whom I had almost fallen in love when she had been a beautiful young girl in her teens. I knew she had grown fat and I knew all too well that I had lost most of my hair. Cherishing the boyhood picture, I knew that middle-aged reality would shatter the romance. And it did.

Thatched Cottage in the Philippines

WHEN the *Laura Maersk* steamed into Manila Bay and I saw spread out before me a populous city so large that it hid the walled town where the Army offices were in 1900, I reminded myself that Miami had barely come into existence in 1900 and had grown to its present size since I had last been in Manila. Why should not this town in the Philippines have grown too?

Frankly, it was with a rather frightened feeling that we left the ship on which we had lived so comfortably for the past month, and battled with the customs officials to get our big equipment passed without unpacking. The Chief Customs Officer happened to be one of those Americans who had stayed over from the early days, and when I used the name of General Harbord, and told him I had been there forty years before he listened. "What do you really want now, Dr. Fairchild?" he said. "Just the courtesy of the port, that's all," I replied. He whistled and then said to his assistant, "Let's give it to him." When I returned to the baggage, the charming granddaughter of Mrs. Howard of Yokohoma days met us with her car and took us to the Manila Hotel.

Almost immediately after we had arrived, there was brought into our room the most beautiful basket of flowers and fruit I ever saw, with enormous sprays of that loveliest of the orchids, *Phalenopsis amabilis*, half covering the mangos and oranges and bananas. Attached to it was the card of Mrs. George Fairchild. From that moment "Mother" and "Father" Fairchild, as they are affectionately known

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to everybody in the Philippines, adopted us, and I am sure close relatives could have shown us no more kindnesses than those they showered on us throughout our whole stay in the islands.

I cannot write of them without emotion. Like some terrible hurricane, the war has blown to pieces what was one of the very great families it has been my privilege to know. "Mother" Fairchild and one of her daughters are now in New York; the rest of the family is still in that unknowable land, Invaded Manila, in the hands of the Japanese army.

The Fairchild home in Pasay is set under great shade trees, and has extensive orchid and ornamental gardens. That "Mother" Fairchild should prove to be, as Mrs. Howard had said in her note of introduction, the most enterprising and successful woman gardener in the tropics, was one of the delightful surprises of our expedition. The house has a pleasant, broad verandah where "everybody" foregathered for afternoon tea. I shall never forget the delightful stories we heard of the Fairchilds' early life in Hawaii, where "Mother" Fairchild was born, and where George began his career as a sugar planter. There were stories too of the early times in the Philippines, where George ever since has played a leading rôle in the sugar industry, and also in Philippine politics.

Dr. E. D. Merrill of the Arnold Arboretum, who had spent twenty-two years of his life in building up the Bureau of Science in Manila, had refreshed my memory of certain Americans who had gone out in the early days and had remained there in the scientific bureaus, which were now largely manned by Filipino scientists. Dr. Arthur Fisher was in America when we arrived, but the veteran forester, Hugh M. Curran, who was one of those I had known best, strode into the hotel lobby the day of our arrival with his son Hugo, as tall and lithe as he. Later I learned to appreciate the fact that these two men deserve to rank among the best trained and hardiest of the jungle foresters. They had slept in the open in pouring rains on volcanic slopes and had traversed the forests of Luzon from end to end on foot. I have met nowhere more daring forest rangers or more

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thorough woodsmen, and I like to think of them now as somewhere in the mountain fastness of those islands where the Japanese cannot find them. The war cloud still envelops them and their whole delightful family, into whose circle at the School of Forestry Marian and I were taken.

Almost before our greetings were over, Professor Curran said, "The Chief of the Forest Service, Mr. Tamesis, has just built a thatched guest cottage in the Makiling Arboretum near where we live, and offers it to you to live in during your stay in Luzon. He calls it his 'Bahay Kubo'—his country cottage." Memories of the Bahay Kubo in sunshine, in rain, and on moonlight nights, and the murmur of the brook that became a roar in typhoon time, come back as I write, for this was the center of our life in the island. From it we set out to explore the countryside by truck, conducted by Mr. Tamesis or by Professor Curran, and accompanied by Sulit, the botanist; by Conicosa, the expert tree-climber and collector, and by Hugo Curran, who kept his eyes out for any palms in fruit. Back to it we brought our collections, and in one of the bedrooms we cleaned, labelled, and packed them for air shipment to Florida.

The Bahay Kubo had walls of woven bamboo matting, a floor of narrow split pieces of bamboo, set wide apart so that the air circulated freely through it, and a roof of thatch made from the leaves of the Nipa palm. Large open windows could be closed with sliding mats. There were open spaces under the roof where the winds could blow through, but the overhang was so wide that no rain came in, even when torrents fell, as they did during a typhoon.

It did not immediately dawn on me what a perfect place the Bahay Kubo really was. The first time I saw it, torrents of rain were falling, its gutters were rivulets, and I had to wade to the little porch. I was alone at the time, and said to myself: "Marian will never be happy in such a place." But next time the bright morning sun shone into the great square windows, lighting up the rooms, and Marian was delighted with everything. We moved in at once.

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A lone cockerel used to perch on the bamboo fence near the back door and call to his friends across the forest, incidentally informing us that it was sunrise. There were streams of termites travelling along the beams outside, making their way to some nest in the dark forest behind the house. The dog loved to roam about where we could see him through the polished bamboo slats that made the springy floor; our servant Guilliemo and his family lived in the kitchen wing, separated from the house by a short "causeway." Shutting in our cottage from the roadway in front and from the jungle behind, was a tight fence of bamboo stakes, and in the walled inclosure were plants of a giant Vanda orchid which had not yet decided to bloom. Fern balls hung in front of the window openings.

In the living room, quite as if they had been waiting for two people bent on making a collection of articles manufactured from palms for a museum that was being built at home, stood a perfectly proportioned table and set of stools made entirely from the leaf stems of the Buri palm. It would have been pleasure enough to live in such a charming "bird cage" set on stilts under great overhanging forest trees, but to be able to use such perfectly designed and executed examples of palm furniture, brought a thrill which I can never forget. Thanks to the generosity of Mr. Tamesis, two sets of this furniture now grace the hall of the Montgomery Palm Museum in the Fairchild Garden.

I recalled that my friend Dr. L. O. Howard, telling of the death of one of the great entomologists, F. C. Baker (who left his vast collection to the National Museum), said to me one day: "And you know he died in a thatched hut out there in the Philippines." After seeing where Baker did die, and after living in the Bahay Kubo, I can only say that, as compared with any mansion on the crowded streets of any American city, a "thatched hut" such as he lived and died in has ten thousand more beauties of shape and color to reward the eye. As for the outlooks from the hospitals where people die—well, let me pass on to pleasanter subjects.

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When the cock crowed and Guilliemo came in with the coffee, the fun would begin. Sometimes our day would start even earlier, for there on the porch were piled the collections of the day before, perhaps things we had gathered with the truck, or more often things that Hugh and Hugo Curran, Sulit, and Conicosa had brought in from the forest that stretched away to the summit of the volcano, Mt. Makiling. Here was a wealth of species such as never before had been assembled for me anywhere, and while I often wished I could spend all my time outside with those long-legged, hardened forest rangers, the Currans—who soon walked me off my feet—I perceived that if it was seeds I wanted, there they were. And so, for many days, early and late, I stuck to the job and Marian stuck with me, cleaning the seeds with Guilliemo's help, labelling them, packing them meticulously in sphagnum moss in cellophane bags, and sewing them up in unbleached muslin. Then Hugo would take them in to the Pan American in Manila. Pan-Air express got them to Florida in nine days.

As I run over the account before me of what became of all these seeds, many of which are doing splendidly in the soils of Florida, I discover that were I to tell about them, as I should love to do, there would be no pages left for the account of the expedition itself, of which this sojourn in Luzon was only a prelude.

Of a few species I must speak, however; one of them being Mrs. Curran's favorite "Jade Vine." In Mt. Makiling it is a rank-growing climber which covered the trees back of their home. Mrs. Curran named it the Jade vine because its dense clusters of pea-shaped flowers, which hung down over her amaryllis bed, were the color of pale Chinese jade. *Strongylodon macrobotrys* was the name which Asa Gray had given this superb vine, without, of course, ever seeing it alive and in bloom. I cannot yet be sure whether the vine we succeeded in getting to America is going to pull through, though it is still growing.

To my surprise, seeds from a strange, ornamental Aroid with immense leaves curled at the edges, which decorated the garden in

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front of the Bahay Kubo, have grown into handsome specimens here in South Florida. It is not the giant of its family, however.

In 1927, Dr. Dalziel and I discovered in the Cameroons an amazing aroid of a distinct type, with spiny stems ten feet tall, forming a large patch in a swamp. I am sure we both believed we had found the largest aroid of the genus in the world, and it was with this idea in mind that the photograph of it was selected for the frontispiece of *The World Was My Garden*. Imagine my chagrin one day when that encyclopedia of Oriental plants, Dr. E. D. Merrill, said to me: "But Fairchild, while you were getting a big aroid of this genus *Cyrtospermum* why didn't you get the biggest one? It is *Cyrtospermum merkusii*, not this *Cyrtospermum senegalense* from Cameroon. It grows near the coast on the island of Luzon."

When I told this to Professor Curran he said at once: "I know where it is." We set out in the Forestry truck over one of the newly made roads, cut through the virgin forest across the island to Port Royal, Infanta. At length Curran stopped the truck, took his cigar out of his mouth, and, pointing to a mass of giant, arrow-shaped leaves standing erect on their petioles and forming a clump thirty yards across, said, "There it is." When you have been interested in a plant because you think it is the biggest of its kind and then find another species of the same genus immeasurably larger, some primitive depth within you is stirred, and your jaw drops. For *Cyrtospermum senegalense* of the Cameroon is a pigmy beside this giant of Luzon whose leaves reach up from their root stocks, buried in the swamp near the beach, to eighteen feet, whereas the tallest of the African form were not over ten feet. It is interesting to cut across the leaf stem of a calla lily and see the tiny holes in it, but you get quite a different sensation when, as I did, you slice through a four-inch petiole filled with holes large enough to put your finger into.

We lunched near this amazing plant on the dark volcanic sands of the shore, and I recalled that it bore the name of a great Hollander, Merkus, who, as an official in the island of Java, fostered the work of the early botanical explorer, Junghuhn. The beautiful turpentine

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pine of North Sumatra, in whose shade we had lunched fifteen years before with the Dutch forester, Brandts Buys, was also named after Merkus. I only hope that his giant aroid, which is now growing well in a pot in the slat-house of the Fairchild Garden, and in the Soledad Garden in Cuba, will not go the way of his pine, which led a lingering existence on our limestone soils and then died.

We missed the showy red airplants, the Bromiliads, so familiar to us in the trees around Coconut Grove. But taking their place in some measure are the great climbing Freycinetias, whose papery flowers make splashes of brilliant pink far up in the crotches of the forest trees. The flowers are followed by handsome red fruits resembling those of the pandanus. I can see Conicosa now as he climbed up after the fruits of Freycinetia multiflora that hung over the stream from a huge tree forty feet above my head, and tossed them down on the bridge. From the way my plant in its box in the slat-house is growing, I predict that it will clamber up our live oaks among the bromiliads.

The Philippine forests are filled with giant lianas, and among them none is more spectacular than the climbing rattan palm. Thousands of men are constantly at work pulling down its great stems from which is made that almost imperishable furniture upon which our people spend so many of their waking hours. If one of these hardy rattan collectors were to drag into your parlor a single liana that he had pulled down from the treetops, in order to show you what kind of leaves it has and to demonstrate to you that it is a palm, it is likely that the short, steel-hard, recurved spines on its leaf-tips would attach themselves to pretty much everything in the room and when the man left, he would drag all the easily movable objects in the room with him.

"A stinging nettle, what of it? Who has not been stung by one some time or other? They make you uncomfortable for a time and then the pain passes." This was my feeling when I was warned not

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to touch the leaves of *Laportea luzonensis*, a relative of our "stinging nettle." To prove I did not fear it I carefully touched one of the glandular poison hairs with my forefinger. The pain that shot up my finger was intense. I expected, of course, that it would subside in a few minutes, but there was pain in that finger for days, and a feeling of paralysis in the tip. This *Laportea* is a handsome plant; the leaves are a gorgeous green, with purple midribs, and the fruits are a most intense blue. I wanted a color photograph of it, and if it had been a rattlesnake we could not have handled it more carefully as we took its picture.

Mr. Sulit informed me that the species I had tested was as nothing in virulence to "the other one," *L. subclausa*. I wanted to see it, but never happened to do so.

A species of this nettle tree which occurs in Australia stings so badly that the naturalist, le Souëf, reports that he felt the effects of its stinging hairs for months. Horses suffer severely from it, he says, but cattle do not; indicating, possibly, the existence of some powerful protein poison, the action of which may be explained, perhaps, when chemists know the molecular constitution of nerve substance.

The longer we stayed in the Bahay Kubo the more I realized that the delightful life we were leading was unique. As I followed Prof. Curran along the slippery and muddy trails that led over the mountain I began to ask where another arboretum such as this was to be found. Makiling Arboretum covers three thousand acres of virgin forest land, and has, according to C. F. Baker, more species of plants growing in it than are known in all the United States and Canada combined. Thirteen hundred of them are woody species.

The roadway, planned by Prof. Curran, climbs twelve kilometers through magnificent forests to outlooks that are superb; foot trails lead everywhere through the woods, one of them to a hot spring from which steam continually rises, bathing in a drifting mist the lianas that hang over it.

Here and there the trees bear tags with numbers which tie them

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to the herbarium in the Forestry School at the foot of the mountain. One of these, I noticed as I passed, told in letters almost obliterated by the years, that it was a species named for Captain Ahern, who I knew was ill at the time in a Washington hospital. I had met the Captain in Manila in 1900, for he was the pioneer forester of the Philippines, and he had been interested in what I had told him of the system of labelling forest trees in Java, devised by the Dutch forester, Koorders.

The extinct volcano of Mt. Makiling rises 3,657 feet above the surface of the Laguna de Bay, the largest lake in the Philippines, on the shore of which is the town of Los Baños, the post-office for the Forestry School and for the Mt. Makiling Arboretum. It is two hours run from here to Manila over a charming country road through villages of little thatched houses, where naked babies play in the sun, and life goes along on an even tenor of births, marriages and deaths.

One evening Hugh Curran, who loves the country and its people and who has a particular fondness for this road to Manila, repeated a little poem he had written about it. I came to share his fondness for this road, as well as for the other charming roadways of Luzon, and so I reproduce it here. I must do it without his consent, for where he is, or if he still lives, I have no way of knowing.

I love the roads that wander
By Pasig's river brown
Through rice fields green,
The lakes between,
To old Manila town.

I love the kindly people
In Nipa cottage brown
Who spend their days
In rural ways
By roads that lead to town.

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I love the Ilang fragrance
At twilight floating down,
The call of bird,
The plodding herd,
Along these ways to town.

I love to think that always
The children, happy, brown,
Will bless their days
And grace their ways,
Fair ways that lead to town.

Much of the daily life of the country people is enacted on the roadside. There will usually be a little trickle of water in the gutter, and women will be washing clothes in it, beating them on the stones with a wooden paddle. Perhaps a baby will be having its bath at the same time, or farther along, a woman will be washing her long black hair.

The carabao appreciate this roadside ditch too, and I do not know any picture of absolute bliss that equals the sight of an ungainly, black water buffalo sinking slowly into the water until just its head is left above the surface. If the water is too shallow to cover it entirely, it has a way of waving its horns like scoops to slosh the water up over its back. They say the carabaos can not be worked more than three hours at a stretch; then they must be allowed to get into the water. Thus a farmer has to have two sets of animals for his day's work.

We asked Mr. Tamesis how long the carabao lived. He said he did not know exactly, but that his family had one which they have had for twenty-five years. "Of course he is too old to work; so we have retired him."

One day, while driving along between the rice fields we saw a sight Mrs. Curran had told us about, but which we had hardly believed. There were about twenty people working in a paddy field, men and women of all ages, and near the middle of the group was a

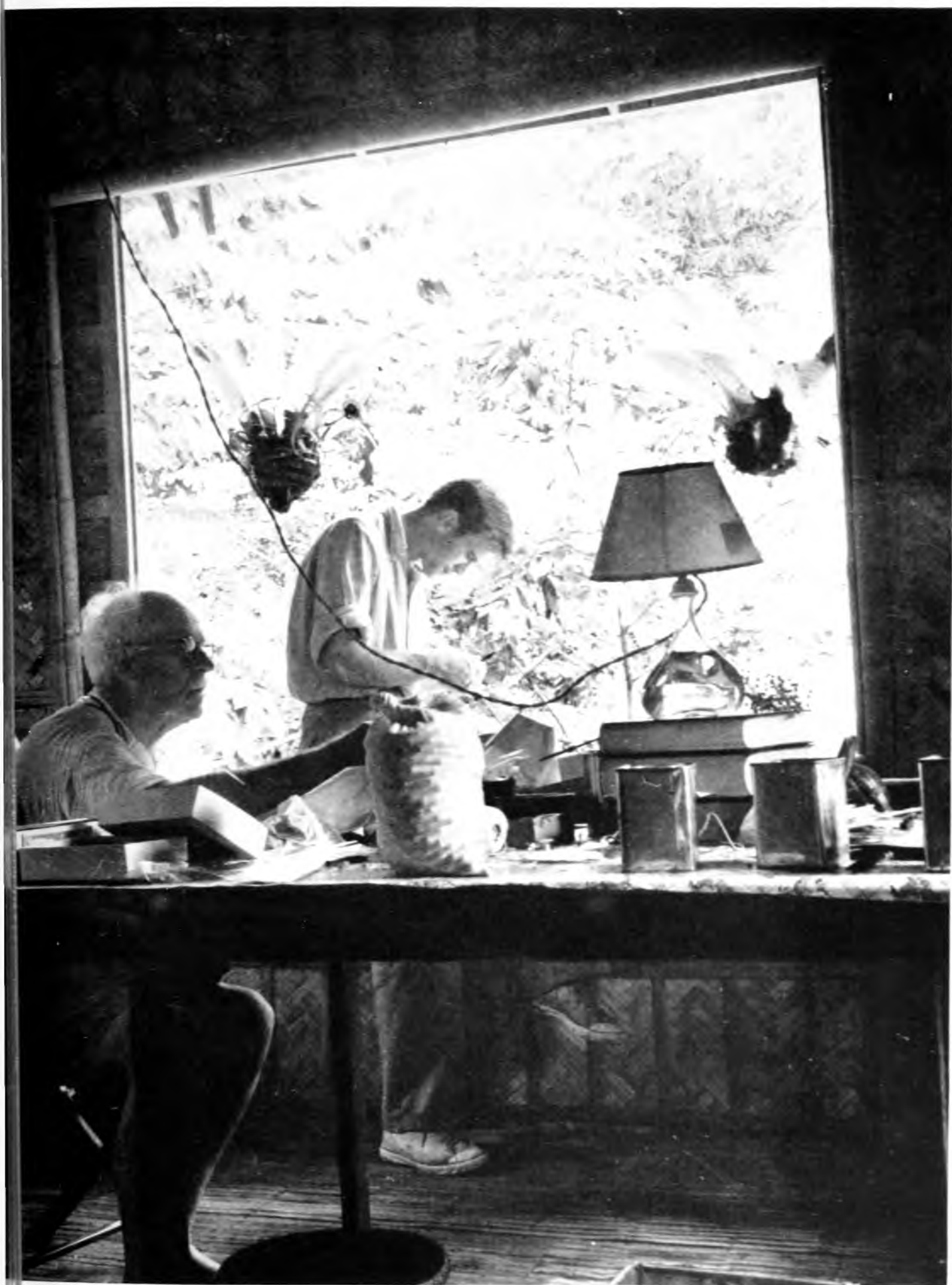
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lad with a guitar, playing to lighten the work. As it was raining, another lad held an umbrella over him. It was curiously typical of these people: they seem to be working most of the time, rain or shine, Sundays and holidays, but they have a good time at their work. They are not a laughing crowd, as a Negro group would be, but they are quietly sociable as one sees them along the road.

On our way home to the Bahay Kubo one evening, there appeared at the side of the road ahead a small tree that sparkled with dancing lights. Flashes, resembling those from the sparklets that children delight in, appeared everywhere in the branches. It was dark except for the rather pale light of a new moon, and the effect was strangely fairylike. As we drew near, it was evident to us that thousands of fireflies, male and female, were chasing one another all over the tree and that this was one of the spectacles associated with reproduction, of which there are so many among tropical insects. At certain seasons of the year they swarm, and we had been fortunate enough to be present. I was reminded of the dance at eve of the stingless bees of Panama, and of the "pregamic" dancing of the yellow-fever mosquitoes which my son-in-law, Marston Bates, is studying in the jungles of Colombia.

In the School of Forestry the students were not separated from the forest—from Nature, if you like to put it that way—as the boys in our Agricultural Colleges too often are. They lived beside it and worked in it, and many of them were expert in climbing trees. Dr. de la Cruz, in charge of the School, told me that on Forestry Day a tree-climbing competition would be held. I waited to see it. Although the soccer game was so popular that only a few of the boys competed in the climbing contest, the winner went up fifty feet of a tree trunk eighteen inches through and slid down again in thirty seconds.

Often I watched Conicosa, the professional botanical collector of the School, make his way without a moment's hesitation up a tree trunk that overhung a precipice so deep I could not see its bottom. He would return with an armful of specimens, using the lianas as a circus performer uses the rope attached to his flying trapeze.



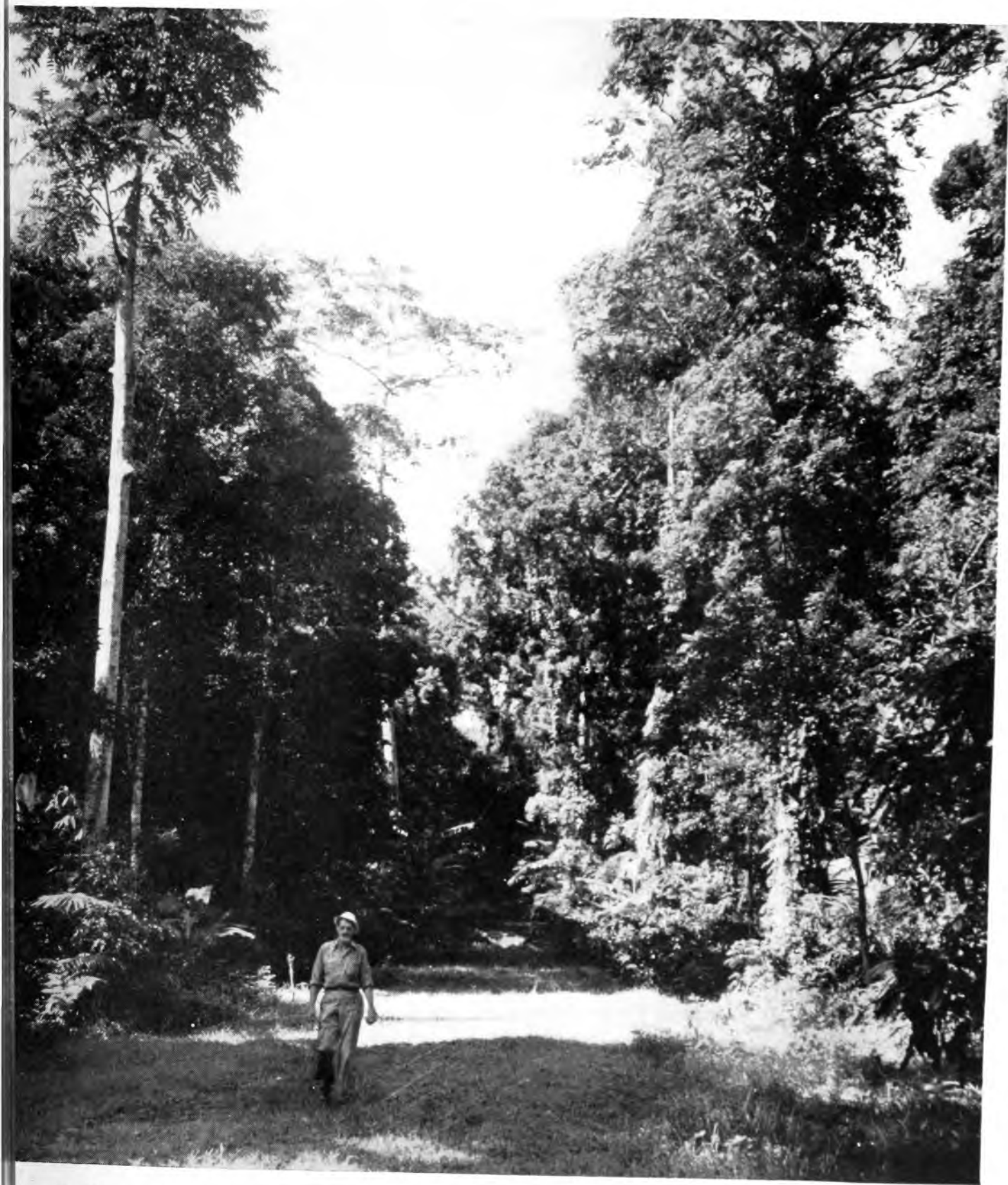
Memorable to me are the places where we have packed up seeds to send home. Particularly so is this table in Bahay Kubo behind which Hugo Curran is standing.



The Bahay Kubo on Mount Makiling, where we spent unforgettable weeks studying the wealth of living forms that surrounded it on every side.



The porch of the Bahay Kubo was a fascinating place; every morning new and amazing fruits and flowers were brought into it from the Arboretum.



Professor Hugh Curran returning from an inspection of the seven-mile road up the slope of Mount Makiling, a road planned by him with such care that it became a real achievement of landscape gardening.



Above, left: Ned Beckwith among the giant leaves of the largest-leaved aroid yet discovered *Cyrtospermum merkusii* (page 43). *Right:* Professor Curran holds the flower of the aroid beside the four-inch petiole, having carried this 18-foot leaf out onto the sand on his shoulder.

Below, left: The clusters of Mrs. Curran's "Jade Vine" were a beautiful jade green. *Right:* The leaves of this branch which Conicosa holds so carefully are covered with hairs so poisonous that a fall into the tree might cause a man's death.

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I do not know where in the western hemisphere tree-climbing is a profession, as it is in the islands of the Orient, wherever the wine of the palm is drunk, or palm sugar is made. I met and talked with various of these professional tree, or rather, palm climbers, and came to appreciate what a peculiar life they lead. Much of it they spend moving about among the enormous bases of the great, waving green leaves, sixty feet above the ground. They sit astride them and hammer at the inflorescences with heavy wooden clubs, or bruise them with large pincers to prepare them for the flow of sap that is to come. When the flow begins, they cut off the tips of the inflorescences and hang a bamboo bucket on each one to catch the sap.

Several times a day they may walk up a tall palm trunk and cross from one to another by a sort of aerial highway made of two bamboo poles, using one to walk on and the other, a few feet higher, as a hand rail. It is hard work, and it requires knowledge to be one of these collectors of "tuba," as the coconut sap is called.

Sometimes "Mother" Fairchild would send the big Lincoln car out to bring us in for a few days in Manila, and on the broad, open porch of their charming home, we continued to meet many of the most interesting people.

Especial friends of the Fairchilds' were Dr. and Mrs. Howard Smith. Dr. Smith was the Health Officer of Manila, and his strict quarantine regulations, which had won for him an enviable name throughout the Orient, were proving their worth during those trying days when refugees were being landed from Hong Kong by the thousands. We were entertained a number of times by the American High Commissioner and Mrs. Sayre in the most impressive but uncomfortable Residence, which had been designed by Washington architects who obviously knew little of life in the tropics.

We enjoyed meeting President Gonzales of the University of the Philippines. He and Mrs. Gonzales gave us a luncheon at which we met many of the faculty; and following the lunch I gave an address to the Academy of Sciences, in one of the buildings where Dr. Merrill had spent so many years, and where today a photograph

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of his then boyish face still hangs on the wall. I can well understand that he must look back with pride to days when the Bureau of Science was forging ahead and turning out that series of splendid publications which deserved to have been kept up to standard, and might have been had the group of Americans remained there to help keep the good work going. For all that, I met in the halls of that Bureau in Manila and in the School of Forestry, which was also initiated in those days, a number of thoroughly competent and interested men who, in their own way, were moving along the roads of science.

VII

With the Foresters of Luzon

MR. TAMESIS had invited me to visit the various forestry stations over which he had charge. I had declined, explaining that I was here to collect palm seeds, but he countered with a plan which I was only too delighted to accept: to make a collecting tour of the Island of Luzon.

It is extremely difficult to express in words what this involved. To say that we travelled by train and boat and truck over the mountains and through the valleys and along the coasts and up the slopes of the volcanoes of an island, the area of which is about that of Virginia, gives very little idea of what it meant to us. And now, as I look at my album here before me and study my notes, I am puzzled; for what is one to do about comparisons? There are no scenes anywhere in the United States which bear anything but the faintest relation to the hundreds we saw, for Luzon is a tropical land, crowded with people doing their work differently from the way we do ours.

There are 7,083 islands in the Philippines, and Luzon is the largest. But of this vast number only 466 cover an area of more than a single square mile. On these islands, however, over ten millions of people are living, nearly twice as many as in California, and almost as many as in the great state of New York with its gigantic cities. But when I say ten millions of human beings I have not said that, person for person, these populations are comparable; for in New York, millions travel in automobiles, and live in skyscrapers, or in

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houses ten times as large as the modest houses of the Filipinos. Yet meet these Filipinos face to face and, if you have formed no unwarranted prejudices towards them, and take them for what they are, you will discover that they appear to be moving toward some sort of goal, and that it promises a more æsthetic and a fuller life than any dreamed of before the coming of the North Americans.

English is spoken in many parts, but it is Filipino English, taught by a generation of schoolteachers who learned their English from other Filipinos and not from the Americans who went out to the islands to teach as soon as it was safe for them to go there. I recalled, as I talked to those young men and women, my early prejudice against our teachers' going out to the Philippines, when I could not see the need of teaching the people English. But those Americans undoubtedly exerted a great influence; to many thousands they "gave the faith," ambition, the desire to expand their lives beyond the boundaries set by their parents' experiences. The coming of the North Americans marked the beginning of a great change, and with the shrinking of the world now in progress, the Philippine Islands are destined, I believe, to take a far more important part than they could have done had those schoolteachers stayed at home.

November is one of the typhoon months in the Philippines, and we seemed to be continually on the edge of one of these terrific rainstorms. In typical native houses, such as the Bahay Kubo, the heavy blinds are drawn across the open window spaces when the wind and rains are strong. Often the lights would go out, and we would sit there in semi-darkness, with not enough light to read by and with the rain on the roof making such a racket that conversation was impossible. The morning after a storm, our clothes in the closets would be too wet to put on; the walls felt wet, and the pretty new palm furniture began to mould. "How would you like it when it's this way for a month at a time?" said Hugo.

The weather had to be taken into account in planning any excursions, but at last it seemed safe to set out for Legaspi, near the southern tip of Luzon and at the foot of Mt. Mayon, which has one

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of the most perfect cones of any volcano in the world. We went by train, a twelve-hour trip through endless plantations of coconuts—trees all about the same size, as most of them had been planted during the boom in coconut oil due to the First World War.

In the early morning I photographed the mirror image of Mayon in the still waters of a lagoon near the hotel, and to show that this perfect cone rises from the shore, I “took it” from the beach nearby. Although it is 7,926 feet high, and Vesuvius is only 4,200 feet, Mayon did not impress me as being higher, probably because there is nothing near at hand to give perspective. What a wonderful thing it would be to have such scenery at one’s door, I thought, and was thankful to learn that Mt. Mayon with its surrounding forests is being preserved by the Filipinos as a National Park.

At the very spot on the shore where I stood that morning, some of the first troops of the Japanese invading force disembarked and began firing at the unsuspecting people who came out to meet them! Yet there are those who believe the world is getting to be a better world. It may be a “better” world, but it is not a saner one.

As we particularly wanted palm seeds, and some of the finest were to be found on the mountain slopes, Mr. Tamesis guided us first to the Bulusan Lake National Park, one of the finest of all the National Parks which come under the jurisdiction of his Forest Service. We lunched in the foresters’ house on the shore of the deep, green crater lake. Turning, I could look down and catch a glimpse of the white breakers rolling in on the shore of the Pacific, far below us; and on the other side I could see the volcano Bulusan rising through the low clouds above the dense jungle. Hugo, who had vanished up a wood trail, came back after we had finished lunch, dripping wet but with several interesting, red-fruited palms that even Mr. Sulit could not identify.

Leaving the Park, we crossed the lake in dugouts, and in answer to my question as to what he wanted to be, the little fellow who paddled me replied, “Oh, I’d like to be a forester,” in such a way that I was reminded again of how much closer these people are

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to the trees than we are. As I remarked before, there is a strong and growing sentiment among the people of the Philippines that the forests they have should be preserved, and the areas which have been cut over should be reforested. To carry out this policy, President Quezon appropriated two million pesos and a fine start was being made, to judge by what we saw of the tree nurseries, the barren hill-sides planted with seedling trees, and the development of the national park areas.

An instructive contrast could be drawn between what the Philippines are doing in the way of preserving their natural scenery and what the South American countries are failing to do with theirs. Imagine twelve National Park areas set aside in the chief islands of the Philippines, and not a single one even planned for in all of that magnificent Andean region of Colombia; with four times the area and only half the population, with snow-capped mountains, and vast llanos, and more than 250 species of beautiful palms to be preserved.

Knowing my interest in the food habits of different peoples, Mr. Tamesis arranged with his friend, Mr. Villafuerte, to give us a typical Filipino meal. The lunch began with a Spanish dish of chicken, sausage, cabbage and potatoes, accompanied by cups of chicken soup and a huge side dish of rice. Then we had the national Filipino dish of suckling pig; the skin fried crisp and tender, and served with a delicious sauce of pounded liver, seasoned with vinegar and spices. And at that point I grow somewhat confused, for I can only recall a bewildering array of fish, four or five kinds of them; squid, tiny fresh-water lobsters, and salt-water shrimps; also tongue, lots of vegetables, tall glasses of coconut milk; and to end up with we were offered mangos, caramel custard, fried bananas, oranges and apples from California, and canned pineapple. Until we came to the dessert, there was no change of plates, and each new item went on top of anything that was left of the previous course. The meal had been a revelation of the degree to which the Spaniard has passed on his love of a varied menu to all people with whom he came in contact.

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The easiest way to see a dense virgin forest is to go along the narrow railroad of some lumbering concession, particularly if it is a newly opened one; so we were delighted to accept the invitation of Mr. Frederick Baker of the Cadwallader Concession to come up to Tandoc in the Camarines Sur province. We took a launch along the coast and then rode a flat-car through a wonderful Dipterocarp forest, arriving in the dark at a clearing where the houses and lumber mill were located.

Until you have wandered along the trails in some forest of dipterocarps, you can have little conception of the beauties of this type of forest. Unlike almost all other forest trees in the tropics, the dipterocarps form solid stands as the pines do in northern latitudes, and since their straight trunks usually bear no branches near the ground, they produce a shade that keeps out much of the undergrowth of the ordinary jungle, enabling you to wander around under them as you would in a northern beech or pine forest. As my friend Foxworthy points out in his *Malay Forest Records No. 10*, these dipterocarps contain the most important group of timber trees in the Malay region. I had an idea I could collect the seeds of *Shorea*, one of the best of the many species, and get them home alive. But the job did not prove so easy, for the great winged fruits, which come whirling down a hundred feet or more from the treetops like seeds of some giant maple, germinate immediately, and the few I was able to find and send to Florida died on the way. As I write, I seem to hear the sickening crash of a giant shorea tree as it fell under the axes and saws of the woodsmen there in the forest, and I hope the day of plywood may come in time to make the further destruction of these magnificent forests unprofitable.

Here we collected the beautiful *Orania palindan*, a palm which almost rivals the coconut in beauty; also a fine fan palm, *Livistona robinsoniana*, of which I have in my slat-house beside me a vigorous specimen waiting to be planted out. We got also a striking aroid with a very large white spathe, many plants of which have been distributed to the members of the Fairchild Tropical Garden Asso-

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ciation for their patios; and a strikingly beautiful Sararanga, whose flower clusters were two and a half feet long and looked like gigantic bunches of little yellow grapes. But, alas! these show signs that they do not like their Florida environment.

Mrs. Baker, who came from Nova Scotia and was quite familiar with our part of that country, was very fond of flowers, and had made a pretty garden on a promontory swept by the sea breezes. She was especially proud of a tree of the *Nauclea orientalis*, because of its beautiful white flowers borne in pincushion-like heads. Marian cleaned the seeds from some old dry fruits we found under Mrs. Baker's tree, and so rapidly did plants grow from them that every morning as I come down to my study here I fondle my specimen of *Nauclea*, and admire its beautiful broad leaves with their striking stipules. It is already a small tree and should flower next year.

We could have botanized for weeks from the little service car that took us back and forth into the forest; but having collected the seeds which were then ripe, it came time to go. We were, of course, ignorant of what occurred immediately after we left. Later we learned that we were scarcely out of sight when the great sawmill caught fire and burned to the ground before Mrs. Baker's eyes. It was not rebuilt by the company, and shortly afterwards the Bakers returned to America. I hope Mrs. Baker some day may see how beautifully the tree from her pretty garden in Tandoc is doing in Coconut Grove.

By the time we had cleaned and shipped all the "loot" of the Legaspi trip, December was beginning. Edward Beckwith, an old friend of John Archbold's, had volunteered to bring his cameras and take charge of the photographic work of the expedition when we met in New York in July. He cabled that he was arriving by Clipper on the first day of December. The Junk would not be ready for another month; so we accepted "Mother" Fairchild's invitation to visit "Buena Vista," their charming villa in the mountains at Baguio. Ned arrived in time to go with us, and we set off in a day or two with the understanding that Mr. Tamesis, Sulit, Hugo Curran,

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and Conicosa would follow later in the truck and pick us up there for a collecting trip through the mountains of Luzon and up the island's western coast to Apari. Numerous interesting palms were known to occur in these regions and we hoped to get seeds of them, for none of them had yet been introduced into Florida, where the chances of their thriving seemed good.

VIII

Highland Sojourn

WHEN you leave the lowlands of the tropics after a protracted stay, and go up into the highlands, you experience a thrill which people who live in so flat a place as Florida cannot very well imagine. At first you wonder why every one does not live in the mountains. After a time, however, you discover that the continued cool, damp weather which invariably characterizes high altitudes in the tropics is different from the bracing coolness of more northern latitudes, and you begin to look forward to a return to sea level. But the exhilaration of the first arrival is delightful, as we discovered when we got out of Mrs. Fairchild's car and warmed our hands at the blazing fire in the fireplace. The wind blowing through the Benguet pines made us homesick for Nova Scotia.

Next morning the rain clouds had passed. We sat in the sun parlor, or out on the terrace, which overlooks the valley where the great gold mines are being operated, and could scarcely believe that anybody could have two such different homes as these two of the Fairchilds, and that they were only a few hours apart. Our "Kampong" and our "Lodge" lie 3000 miles apart, in South Florida and in northern Nova Scotia. Although the contrast between the species of plants which "Mother" Fairchild was growing in her garden at Pasay near Manila and those on the terraces at Baguio was not so great as the contrast our own offer, in Florida and in Cape Breton, it was striking enough. There were various tree ferns; eucalyptus trees; the *Cupressus bethami*, native of Guatemala; beds of amaryllis in full

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bloom; and a large hexagonal slat-house filled with orchid plants. *Phalanopsis*, *Vanda*, *Dendrobium*, *Rhenathera*, and that giant of orchids, the *Grammatophyllum*, are some of the thousand native species that can be grown out-of-doors in Baguio. Indeed, the true orchid fancier could settle for the rest of his days here. That is, provided the rainfall did not drive him out somewhere into the sunshine; for whereas Makiling boasts only 80 inches of rain, Baguio is reported to have had 45 inches in a single day! "Mother" Fairchild's hillside gardens are the wonder of the place. On terraces, one above the other, they cover a slope for hundreds of feet down into the valley below the house. There must be a mile of them, all built of stone, and offering perfect drainage. To go up and down these at an altitude of five thousand feet would make most Florida women gardeners feel as though they had climbed the Washington Monument.

Baguio was unbelievably American. Its houses, shops, paved roads and parks all gave an impression of luxury and elegance, which was inexplicable until you took into account the gold mines, and the wealth which has poured out of them and sought expression in American comforts and American ideas of architecture.

And in this picture it was something of a shock to see the bare-footed and trouserless Igorots in their gee-strings, wandering about the streets mingling with the warmly clad Americans. You could tell the bachelors by their red gee-strings; married men wear sober blue.

One of my chief reasons for coming into the highlands of Luzon was to see with my own eyes the famous terraces of the Igorots, which rank as some of the most extensive in the world. To one who is accustomed to high wages, and remembers the cost of his low stone fence at home, terraces seem impossibly expensive. When he sees retaining walls from fifteen to fifty feet high, and then learns that there are literally thousands of miles of these terraces in the country of the Igorots, he gains an inkling of the back-breaking labor of which these remarkable people are capable.

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Although I had seen the ancient terraces of the Phoenicians in Malta, and the grape-covered terraces of southern Italy and those of Switzerland, as well as the rice terraces of Java, I had never been near enough to one in the process of construction to see how it was built. In Baguio I had the good fortune to watch for a whole morning a group of expert Kiangnan terrace builders at work. There were eight men, some boys, and one woman, and they lived crowded together in a single tent, as primitive as the quarters of any road-building gang.

I have always wanted to build a terrace on our hillside in Nova Scotia because of the perfect drainage which a terrace affords; so I closely watched these powerful Igorots carry the big boulders from the pile which the truck had deposited, and place them in a ditch three feet deep, dug at the base of a sloping cut in the hillside. No mortar was used, but the large boulders were chipped and turned about so that they would form a permanent base for the wall of smaller rocks, which was built at a slight angle to the perpendicular. With each foot added, the dirt was packed behind the rising wall, between it and the sloping, cut surface of the hill. When the top of the first wall was reached, a horizontal shelf was made in the hillside, varying in width from a few feet to a rod or more, depending on the slope of the hill; another ditch was dug at its back, and another wall was laid, with its base in the new ditch. I was amazed at the speed with which these quiet Igorot terrace builders worked, and when I viewed the extent of the terraces they had built in seven days, I could only feel that I was in the presence of disciplined people—people who had learned to toil from childhood, and who did not look upon what to many others would be back-breaking labor, as anything out of the ordinary. Rain mantles, each made out of a Buri palm leaf, protected their backs; and all day long these people worked, even in a pouring rain.

Alert as I had become to the influence of the human palate on agriculture, I was keen to see what these mountaineers grew on these carefully built terraces. Many plants could probably be grown

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on them which would give their owners a variety of vegetables and grains; yet only two seem to be generally cultivated: rice and sweet potatoes. Without considerable experimenting, and much propaganda, the agriculture of the Igorots could not be changed or improved, for, to one of them, "what could be as good as boiled rice and chips of sweet potatoes fried in deep pig's fat?" The crops developed by the ancient Incas on their terraces, or the Javanese or Balinese vegetables, or even those of the Venezuelan and Colombian highlands, all these might grow well in Luzon. But who would eat them?

And yet, as we stood watching the terrace builders at work, a man came by leading to market a dozen scrawny dogs, each attached to a string. The technique is to have the dogs half starved, give them an enormous meal of rice—let them stuff themselves, as it were—then kill and roast them. If a taste for dog meat can be acquired, it would seem that almost any other food prejudice could be overcome; but I know a widely travelled American who has never learned to like cheese; few Frenchmen can be induced to touch a sweet potato; and there are many Irish who have never overcome the idea that cornmeal is good only for chicken food.

While stopping at "Buena Vista," the gardener called my attention to a clump of Japanese bamboo, *Phyllostachys henonis*, which, though planted on one of the terraces only two years before, had already made long underground rhizomes and was spreading fast. It was very beautiful, but it brought to my mind those days on our place in Maryland when Wills, our gardener, was working hard to get rid of this same species, which was invading the experimental garden. And I remembered Professor Charles Sprague Sargent's observations that in the forests of Japan he had found certain low-growing bamboos ruining the beautiful flora of the forest floor. "Take it out," I advised.

This incident attracted my attention to the matter of weeds. The local forest officer in Baguio took us up into the mountains back of St. Thomas to see what he called the worst weed in the Benguet and

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Bontoc provinces. It was a blue-flowered *Eupatorium*, which the forester said had been determined as *Eupatorium chinensis*. It had spread over the landscape in a most alarming way, threatening to kill out all the native vegetation. In an effort to check it, plantings had been made of an alder, *Alnus maritima*, which seemed to be shading the ground and discouraging its growth. Was this jumping from the frying pan into the fire? I wondered; for on our place in Nova Scotia the black alder is one of our bad weeds.

There is no saying what will become a weed. Back of his house in the Makiling Arboretum, Hugh Curran showed me a wonderful growth of *Thunbergia grandiflora*, that blue-flowered vine which every householder in South Florida loves to see over his porch. Pointing to a group of forest trees which it had smothered, he remarked: "It is one of our worst pests."

Again, the "Jumbie bean," *Leucæna glauca*, prized in the Philippines, is thought by many in Nassau to be one of their worst weeds, and also has been considered a nuisance in the stony soils of Coconut Grove. It is a small, leguminous tree with leaves which horses seem to like to eat, but if they do, the long hairs of their tails fall out. Introduced into the Philippines from Mexico, it grows so fast and makes such good charcoal that a large area has been planted by the Forestry Department, out of which a considerable profit is derived.

The region where the *Eupatorium* weed occurred was cattle range, which should have conveyed something special to our minds, as we discovered on returning to Baguio. We went into one of the fashionable stores to get something and were waiting at the counter when both of us noticed little pools of blood where we were standing. It took us a few minutes to realize that we had both picked up leeches; the leeches had dropped off, but we could see marks where they had been. It was a spectacular way to be reminded of this most annoying pest of the Oriental bush lands, a pest happily unknown in the Americas. There is nothing painful about the bite of these leeches, but they are disgusting and their punctures sometimes lead to sores. They frequent the cattle pastures.

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A "carabao typhoon," slow-moving and strong, the center of which missed the islands, brought rain enough to close the mountain roads for several days; but at last the weather cleared and we left the luxury of "Buena Vista" to start off again.

Our transportation consisted of a comfortable car and the not so comfortable truck, fitted up with seats. The personnel of this seed-collecting party was a most unusual and happy one. Mr. Tamesis, the Chief Forester, who had lived and studied in America, and whose good temper was unfailing, had a fund of stories of the Philippines that seemed inexhaustible, and a quick eye to catch sight of any palm, tree, or vine that happened to be in fruit; he had been trained by Professor Curran and had gone on foot over much of the island of Luzon. Mr. J. M. Sulit's familiarity with large numbers of the wild trees of the forests, not merely their names but their uses and characteristics, was always a source of surprise to me. Hugo Curran insisted on standing on the back of the truck all the way, to see the vegetation better. His call for a stop was always followed by the finding of some palm in fruit, or some other interesting tree back up the mountain slope in the forest. Conicosa, the College collector, was a very quiet little man who knew a lot about the thousands of forest trees he had scaled for specimens. Then there was Ned Beckwith, loaded down with the battery of cameras which he brought into action the moment Hugo or Sulit or Tamesis or perhaps Marian spotted something we wanted. It was Conicosa who climbed up and got it. For audience, sometimes crowded in the truck, we had a varying number of foresters picked up along the way at the different Forestry Stations—all eager to catch something from the running chatter of the "big men," and always polite to the American lady.

The road from Baguio to Bontoc is one-way for much of the distance, cut into the side of the mountain, so that if you are on the outside you can look straight down, sometimes a thousand feet or more, to the valley below. It became a standing joke that we were running along "two feet from eternity."

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For the first part of the way the road wound up to 5,000 feet through a dry, almost desert, landscape of coarse grasses and scrubby, thorny trees. This was the "parana." Then suddenly the car shot through a cut in the rocks and we were instantly in the cool mist of a dripping rain forest, with tree ferns, tangles of lianas, and climbing bamboos covering everything. We had passed near San Gregorio, from the lee side to the windward side of the mountain.

Beyond the rain forest we came into the drier country again, and then to Bontoc, in the Igorot country. This was the starting-point for Banaue, where the finest terraces are to be seen. Marian was fascinated by the gay, hand-woven dresses of the women and the bright blankets the men wore as the cool of the evening came on.

Under the houses in Bontoc, as in many of the villages in the Philippines, are the pig sties, where all the offal from the house goes, to be converted into pork. Plumbing and animal husbandry are combined in a way rather shocking to our sensibilities, but it is the best these people have invented, and it seems to work.

In spite of all I had read, and all the pictures I had seen of the rice terraces, the view of the valley at Banaue was beyond all I had imagined. But there was one discordant note. As we stood looking down into this valley of terraces I saw, far below us, an unsightly, corrugated-iron roof. "Who put that ugly thing there?" I asked. "The American Army," was the reply. When a few days later I wrote to my old friend General Harbord, reminding him of his days in the Philippines, I remarked on this token of ugliness, one of many such, and got a semi-apologetic reply. General Harbord has his own appreciation of the beauties of this scene. Trying to describe the terraced valley of Banaue, I discover that he has done it so much better than I can that I am taking the liberty of quoting his words. They are published as the foreword to Samuel E. Kane's *Thirty Years with the Philippine Head-Hunters*, an amazing narrative.

"Their terraced mountainsides," General Harbord wrote, "are one of the wonders of the East. At a distance they look like giant

is early morning when
st saw Mount Mayon,
most perfect volcanic
in the world," and I
d that it had two per-
ones, one in the lagoon
at my feet.



There is something sinister
about this view of the
Mayon volcano, for on the
dark gray sand from which
I took the photograph the
Japanese soldiers made their
first landing in the Philip-
pines.



A mountain slope in Luzon which Mr. Tamesis and his foresters are trying to cover with trees whose shade will kill out the Kogan grass. The horizontal lines are pathways used by the tree planters.



Right: Before man came, the forests of the earth perhaps were full of gigantic, unfolding fern fronds like this we saw outlined against the mists of San Gregorio. *Left:* Florencio Tamesis, Chief of Forestry of the Philippine Islands, has undertaken to save the magnificent forests and reclaim barren hillsides from Kogan grass.



Corner, in his *Wayside Trees of Malaya*, speaks of the Naucleas and Neonaucleas as Bur-Flowers. From the way *Nauclea orientalis* is growing on The Kampong, I predict a bright future for it in our gardens. The photograph is of *Neonauclea reticulata*.



Left: Conicosa on the old stump of a Buri palm which had been cut back to yield sap for sugar-making. *Right:* The "tree-clad tropics" actually have many deserts with dunes of shifting sand, like this one at Paoay, Luzon.

As the reflections from these level rice basins far below me struck my eye, I could not help speculating on the other crops that the Igorots of Banaue might have grown on them.



Left: To make a terrace wall, the Igorot expert first digs a ditch and packs it with large rocks carefully fitted together. Upon these he lays smaller rocks against the sloped bank. *Right:* Built without cement of any kind, these terraces of boulders occasionally fall down.

These almost naked men were rebuilding this terrace in a cold rain.



Why should these laughing Igorot women have been so afraid of us as to gather up the sweet potatoes they were washing and to scamper down the road when we approached? 64E



Looking through the Benguet pines across the mountains of Luzon, from the terrace of Buena Vista, the Baguio home of the Fairchilds.

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stairs, rising from valley to mountain top. At close range they are seen to be successive levels or irregular areas for the irrigated cultivation of rice. The retaining walls are as much as fifty feet in height. I personally have seen a mountain near Banaue with over three hundred of these terraces from its foot to far up its side. Yet these people have no tools except the rude bolo and no arms but the spear and the head-axe."

At so short a distance from the modern cities of Manila and Baguio, I was not prepared to find people so shy that they ran at our approach, and to whom a box of matches was a much-prized gift. We found the air cold and raw, but the men we passed on the road wore only a gee-string and a funny little straw hat that seemed useful chiefly as a pocket. The women wore skirts and jackets. An isolated, mountain race, one might compare these people with the Highlanders of Scotland as an interbreeding, clannish human group with stern and valuable qualities.

Mr. Sulit had told me that there was a very dry spot in the province of Ilocas Norte, where shifting sand dunes and a xerophytic type of vegetation was to be found; he thought that there I might perhaps discover plants which would be suitable for the coasts of Florida. So we went to see Paoay. A sand storm was blowing across the Abra river as we arrived, and the dunes reminded me of Mogador, on a very small scale. There was the same struggle of trees to live under a load of sand that slowly covered them.

I was disappointed not to find more interesting plants on the dunes; but one lavender-flowered shrub with fragrant, entire leaves seemed attractive, and Conicosa and I gathered the few seeds we could find. It is *Vitex trifolia*, var. *ovata*, and it appears to be making an unusual record where it is growing in the Fairchild Garden, adding another desirable shrub to the rather meager list of plants that will grow near the sea.

We visited several of Tamesis's Forest Stations, and as living souvenirs of our visits we have many palms and other plants, among

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them two superb, tall fan palms, *Livistona saribus* and *Livistona merrillii*, beautiful blue-fruited and red-fruited species respectively.

There were many of these Forest Stations, each with its nursery of seedlings, and we were greatly impressed by the careful way the plants were looked after, and by the industry evident when we looked up at the grass-covered mountainsides and saw lines of seedling trees, which had been planted by the thousand as far up as the boys could climb. In my imagination I could see these tiny little things forming forests again, where now only the coarse "Kogan" grass, *Imperata contracta*, had spread its underground roots. In combination with grass fires, this pest of the tropics has shoved back the beautiful forests which, it is believed, once covered the whole Archipelago. Now, forty per cent of the mountain slopes are disfigured by this ugly, useless grass. It is a variety of the hated "Lalang jawa" of the Malay Peninsula, and its close relative *I. cylindrica* is the "Alang-alang" that every forester in the Netherlands Indies curses. Probably no other single factor is more responsible for the rapid destruction of the magnificent forests of the tropical world than the grass-and-fire combine, which every year destroys millions of acres of trees. Nine tenths of the magnificent forests of Madagascar have disappeared forever, and soon those of Sumatra and Borneo and even of New Guinea will feel the influence of this or some other equally vile alliance of underground grass roots and annual firing by stockmen.

The method of forest destruction is simple. A settler clears a patch of forest. Something happens to him, and the patch is neglected and grows up to kogan grass. The grass, with its underground stems, creeps up around the trees at the edge of the clearing. Some stockman burns it over to give his cattle a chance at the young growth which comes after, and the fire kills the trees around which the kogan has crept. The dead trees fall and open the ground to sunlight; the kogan creeps up around the trees which were not killed. The stockman burns off the grass again, and again a ring of trees is killed. Year

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after year this process is repeated, and vast forests are destroyed by it. If the firing is stopped, the forest shade will be able to discourage the sun-loving grass and kill it out in time.

But where there is no forest left, plantings of trees must be made, as these Filipino foresters knew. I could not help thinking that these men were carrying on in the traditions established by that group of forceful, scientific Americans who followed close on the heels of the army of occupation, and brought methods of investigation, which build up instead of tearing down. If one would really see what the Filipinos are doing he must get out of Manila, with its shops and movie theatres and other of our American-city innovations.

We had planned to tour up the East coast of Luzon and return by the Cagayan river, where there are some rare palms. But heavy rains had so swollen the rivers that, after crossing one on a bamboo raft and finding the next one too dangerous to attempt with our heavy truck, we returned to Manila, keeping to the coast. It was on this coast, not two years later, that the first fighting with the Japanese began.

One of the places I wanted especially to see was the Experiment Station at Lamao, on the now famous Bataan peninsula, where P. J. Wester had made a collection of tropical fruit plants years ago and from which he had sent us many seeds. Before going to Manila, Wester had been one of the first investigators to work in the little Plant Introduction Garden in Miami; so he knew our Florida soil and climatic conditions and what plants were likely to succeed. I wish I had the space here to recount our experiences with the many plants he sent in.

Dr. H. S. Silayan, Director of the Bureau of Plant Industry, drove me out along the coast to the Station and spent the day showing me about. Having lived in California, he was familiar with the irrigation methods in use there and was busy making a dam, so that they could take better care of the trees in the dry season. Wester has long since passed away, but the simple thatched house in which he lived still stands, and I photographed it. His voluminous notes and

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observations are preserved in many bulletins of the Bureau of Agriculture, and his *Food Plants of the Philippines* is a standard work. These are fitting monuments to his unusual energy and tireless activity.

I must mention one tropical vegetable that was growing in the Experiment Station, one that was often served us on the hotel table—the “Cigarillas,” or Asparagus Bean. Its pod is a curious thing, being four-cornered, with wavy frills along the four edges. It is used as a snap bean, and when properly cooked is a delicious and nutritious vegetable. This *Psophocarpus tetragonolobus*, as it is known to the botanists, has so many different native names that it would require a paragraph just to list them. Back in 1918, seeds of two varieties of this bean were sent to us from Los Baños, and we grew them in our Experimental Garden in West Florida, cooked them and found them very good. Why we did not pursue our investigations of this promising vegetable, I do not remember. The soy bean investigations of Piper and Morse had at that time absorbed all the “bean attention” of the specialists, perhaps. Now that the soy bean covers millions of acres of farm land in America, and its chemistry is thoroughly known, this other bean, which contains 17% of fat and 33% of albuminoids and 12% of starch, deserves to be studied in its turn. In my friend Ochse’s *Vegetables of the Dutch East Indies*, I find the statement that its pretty blue flowers are used to color dishes for the table, and also that a curious fungus attacks the stems of this legume, causing them to swell and become fragile and orange in color, providing the Javanese menu with a great delicacy. Unfortunately, the seeds I sent in 1939 were planted in the winter season and never matured any pods.

I have digressed here from my narrative to emphasize the fact that the possibilities of thousands of tropical plants still remain to be investigated by the people of the temperate zones, who have settled down with only a handful of plants to play with and have shut their eyes to the hundreds waiting in the tropics.

As our delightful days in the Bahay Kubo drew to a close, it was

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natural to look back and try to compare my earlier impressions of the Philippines with those of today. Forty years is a long time to leave a country unvisited; almost anything can happen in that time.

In 1900 the fighting between the American troops and the Filipinos was still going on. In 1940, President Gonzales showed me the plans of the great new University that was about to be built.

Dr. Howard Smith, the genius of the Health Service, showed us with pride his new and complete equipment for protecting the people from various tropical diseases, the causes of which were not even suspected in 1900. We had been obliged to comply with his stringent regulations before we could land.

Highways had been built along precipitous mountainsides to accommodate an invention that was not, in 1900, much more than a dream.

Agricultural research bureaus, which were begun by a group of American scientific youths when our own Department of Agriculture in Washington was practically in its infancy, were carrying on; and gradually there was being disseminated a strong confidence in scientific ideals, in something more tangible than tradition and superstition.

When the history of the Philippines is written, I suspect that an important chapter will be devoted to the coming of certain scientific men to its shores; young men who grew enthusiastic over the wealth of possibilities which lay untouched in its natural resources; and who proceeded to start a Bureau of Science, an Arboretum, a Department of Agriculture, Museums, Herbaria, and other scientific institutions; in short, young men who began to apply to the Philippine problems the recently invented tools and processes of modern science.

I saw these young Americans when some of them were mere youths, forty years ago, and I should like to set their names down here. Some have passed on, others have returned to the United States, and still others are in the lands over which Japanese troops are dominant. These names are Merrill, Ahern, Curran, Copeland,

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Baker, Fisher, Cuzner and Strong: botanists, foresters, entomologists, zoologists, medical men and teachers of science. There were many others, but I did not know them. These men hastened the dawn of a scientific consciousness that is pointing the way towards the fuller life which opens up with every new discovery in science.

We Set Sail in the Junk Chêng Ho

CHRISTMAS was coming, and the day was approaching when the Junk *Chêng Ho* and its crew might be expected to arrive in Manila Harbor. Anne Archbold was planning to fly over from Hong Kong. She had written on October 15th about the launching of the Junk.

"The Great Event passed off most beautifully yesterday," her letter read. "When I went down at nine A.M., a priest in heavy red brocade robes was holding a ceremony between the wings of the bow of *Chêng Ho*—a fire burning and smoke from incense rising. The entire length was festooned with small red papers which, I suppose, had prayers in them; high standards of red and a long streamer of red paper aft. The Chinese, British and American flags were flying. All most colorful. In the laboratory was placed Tien Fei's shrine with plates of whole chicken, ducks and fruits for offerings. Incense, of course, burning. The priest went aft onto the high poop deck, held a long ceremony. A canvas cover was erected alongside with chairs and refreshments where we sat and watched the final preparations. Quite a crowd came. It was all very gay and charming. Too bad you could not have been there."

We were sitting at luncheon in the big open dining room of the Manila Hotel—Ned, Marian and I—when off across the harbor we saw what looked like a Chinese Junk moving among some anchored vessels, but a Junk without its characteristic sails up. "If it's moving without sails, it must be the *Chêng Ho*," said Ned, and,

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after telephoning the Fairchilds to follow us, we were off to board her.

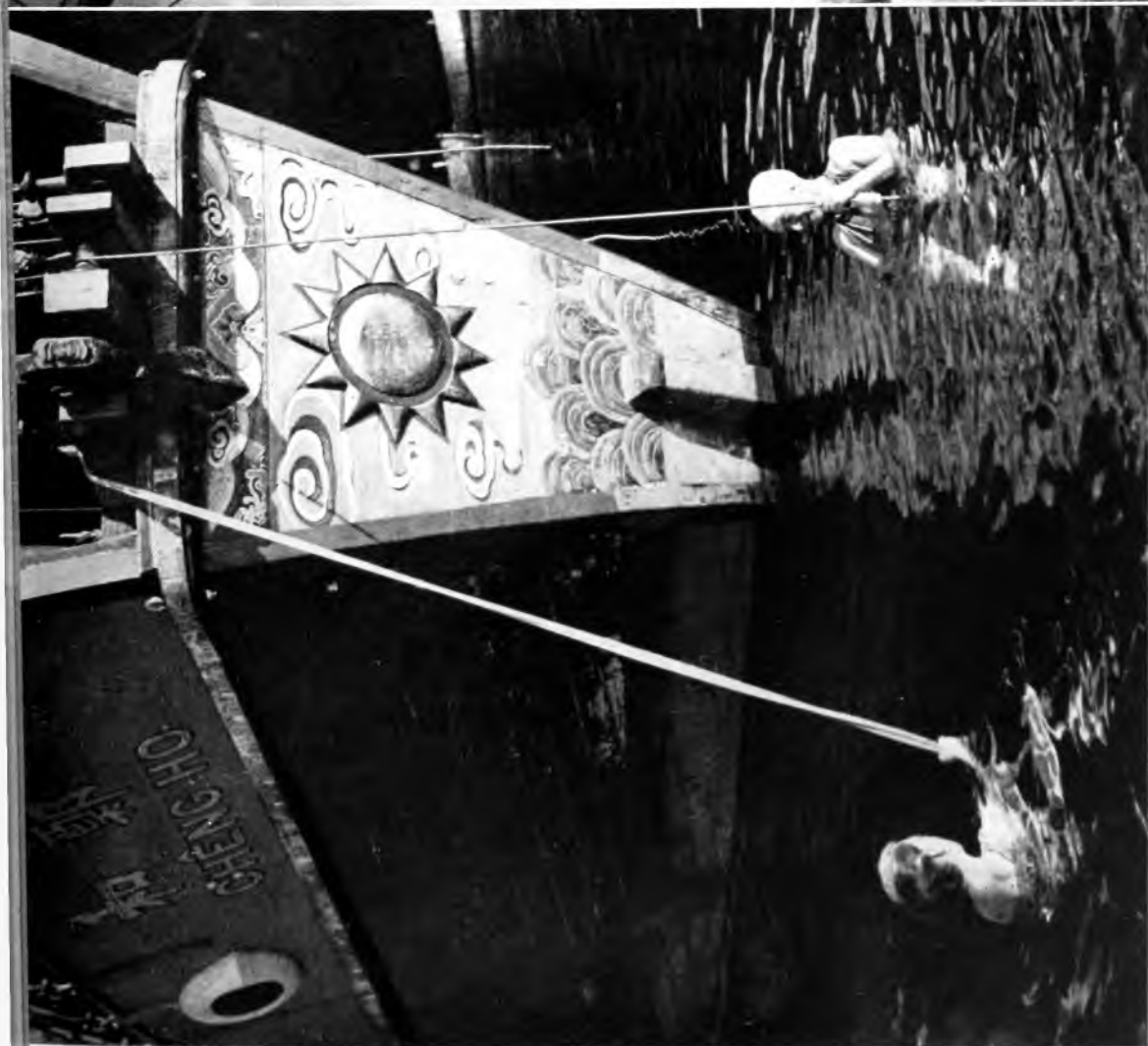
The *Chéng Ho* was most picturesque: her masts set at strange angles, her open bow with eyes on either side for her to see by, and a gilded sun in front to light the way. On each side of the stern was a flying phoenix, and the whole stern was carved and painted with a monstrous "Yei" bird, with the rising sun, the seven sages of good luck, and a lot more.

The lounge had a seat across the whole end, divided in the middle by a table of red lacquer, the sides elaborately carved and gilded. The seat covered the rudder, which in a real Junk would be steered from this place, but the *Chéng Ho* was steered from above by a wheel on the high poop deck.

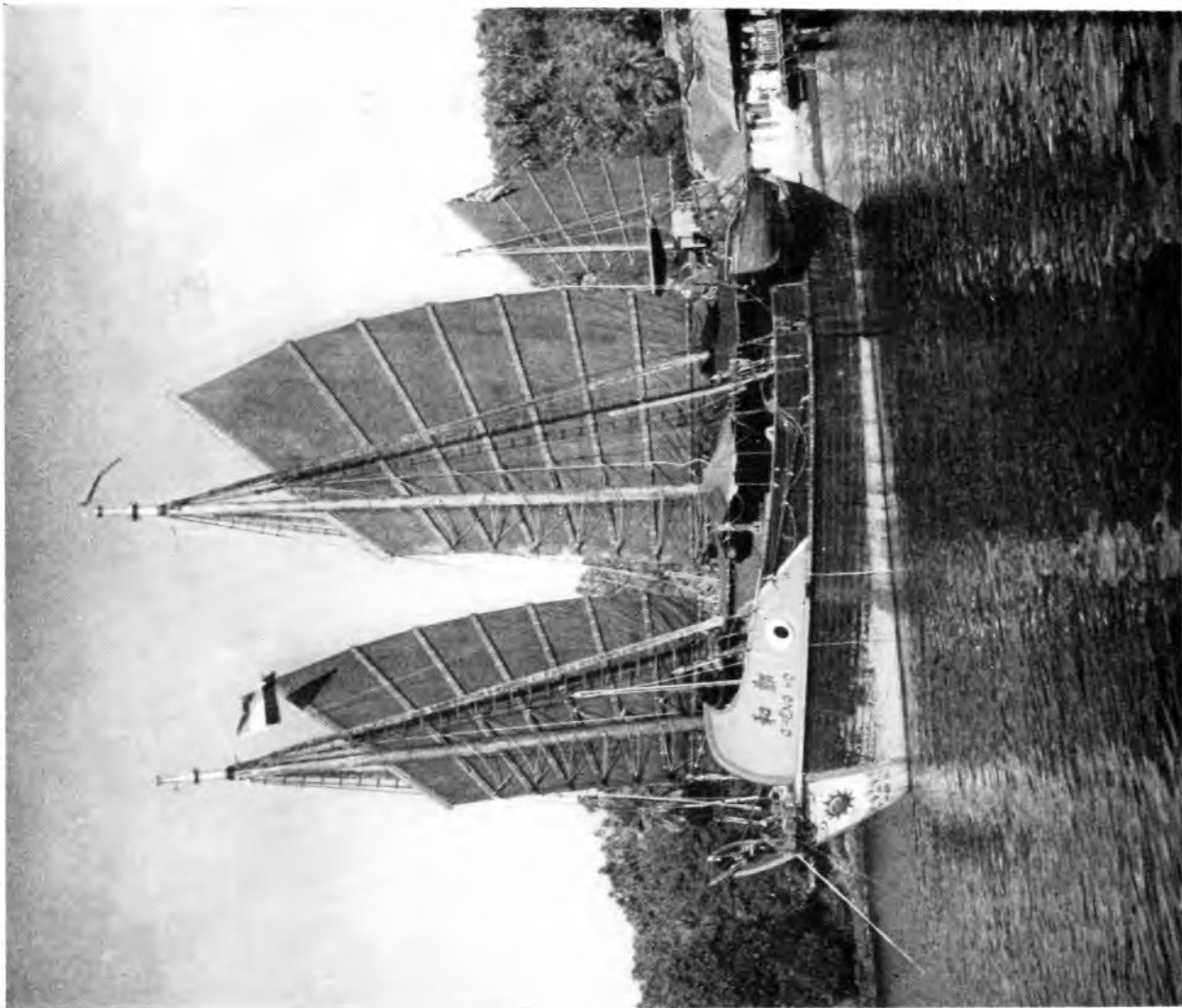
Below decks, the beautiful teak walls gave a restful darkness after the intense light off the water, and each cabin had some bit of lovely old Chinese carving in it.

Having in our minds the memory of how small the Junk had looked in the slipway at Hong Kong, Marian and I were agreeably surprised at the roominess of the finished craft. And as for the laboratory amidships, the dimensions and the equipment for which had been discussed with Kilkenny when he was in my study in The Kampong, it seemed too good to be true.

When I entered the laboratory, four walls seemed to shut out the sea and furnish a seclusion in which I saw at once I was going to have the time of my life—as soon as my microscope and books, the typewriter, the tunnel for drying seeds, the case for tools, the cellophane bags, and the boxes for the moist sphagnum and the ground peat had been arranged. The first impression proved correct, for even with ten Chinese lunching and sleeping on the boxes just forward of my laboratory, with all sorts of happenings going on at the gangway, and the frequent opening and shutting of the windows with each rain squall, I was able to lead something of a secluded life. I would often have hours alone, looking over the fruits that Hugo brought in, trying to find out their names in my botanical books,



Right: The stern of the *Cheng Ho* was decorated in classical style with the "Yei" bird, and dragons, sages, and phoenix. The lower port-holes were over my bunk; the square windows lighted the main saloon under the poop deck. *Left:* Below the water-line a Chinese Junk is as sharp as a modern yacht, but above it is square, so that it can lie "bow to the dock" and pay rental on a narrow space only. Here are Marian and Anne Archbold swimming in the harbor of Siao.



Right: The *Chéng Ho* with her sails up to dry, in the harbor of Siaooc. The Gilded Sun on the square open bow was to give the light by which the “eyes” could see. *Left:* The finest hats made in the Philippines are of braided fibers of the Buri palm, pulled out of the green leaf stem, as these boys of Burias Island are demonstrating.

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and writing out my own descriptions of them. Outside, Marian, Fenton, and others of the staff would be busy cleaning seeds, and Ned Beckwith would be taking color photographs of the plants.

My notebooks and albums, Ned's kodachrome slides around me here, the trees which have flowered, the pretty palms now growing in their pots—all are priceless souvenirs of that laboratory on the Junk *Chêng Ho*.

Before I go further with this narrative, I want to make it clear that I am no seaman. On previous voyages I tried to memorize the sixty-six or more names of the parts of a boat, its rigging, gangways, and davits, and so forth, but I always proceeded to forget them. To me, a boat is a house crowded with people, floating in the water instead of fixed on land.

Others may enjoy the confusion that goes with getting started on any kind of an expedition, but to me it is always a nightmare. And I am always obsessed with the fear that something essential will be forgotten.

To this departure, which meant taking leave of the delightful people who had done so much to make our stay in Luzon attractive beyond anything we had dreamed possible, was added a perfect tangle of last greetings. They were hurried leave-takings sometimes, and now, to look back on, sad beyond words—for where are all our friends today, under the complete blackout of the Japanese invasion?

At the last moment, there came an invitation to lunch with President Quezon in the beautiful old Spanish palace of Malacañan.

The President was interested in the *Chêng Ho*, and asked Mrs. Archbold what she was going to do with it when the expedition was over; whether it might be available for scientific work in the Philippines. He said he was going fishing in his yacht, *Casiana*, and would anchor off the island of Marandaque, and he suggested that we go as far as that with him and let the *Chêng Ho* pick us up there. We

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accepted at once, and left Manila with him on January 8, 1940. We spent one night aboard, in the luxurious air-conditioned cabins of the *Casiana*, which had been purchased by the Philippine Government from the American oil magnate, Doheny, and had been specially fitted for tropical service. The vessel was sunk later by the Japanese.

If we had had any idea of seeing much of President Quezon on this short trip, we were to be disillusioned, for he spent almost the entire time playing cards, his favorite form of relaxation. I told him that General Harbord was an old friend of mine and he took the occasion to say some very complimentary things about the General. He seemed proud of the forestry work of Mr. Tamesis, and I put in a plea for a Plant Introduction Service.

We overtook the *Chéng Ho* next morning, with her picturesque henna-colored sails all set, the sun illuminating the gorgeous gilded and painted carvings of her stern and sides. She was a beautiful sight and Mrs. Archbold had good reason to be proud of her.

On board with Kilkenny were Captain Fant, an English friend of his who had run Jardine Line ships in and out of Borneo waters, Fenton Kilkenny, and Daan Hubrecht, son of the Netherlands Minister to Italy, who spoke Malay well, having lived on the family's big sugar estates in Java. Daan was to act as Liaison Officer. Hugo Curran had needed little urging to accompany us as plant collector, while Edward Beckwith, chemist and explorer of Alaska and the West Indies, in addition to being official photographer, was able to help us out later with his profound knowledge of navigation. It was almost entirely a volunteer staff.

Ten Chinese made up the crew; several of them had sailed with Kilkenny before. I could not tell them apart until I made sketches of them, and their names gave me more trouble than the names of the many plants we found. There was Mo So, the engineer, and Ah Gunn, the boatswain, and Ah Fook, and Fo Tai, and Kai, and Han, and Sin, and Sing, and Jack, and Sam the cabin boy. They were picked men; and although for six months they literally lived around

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my study, I never heard but one row, and that was when they decided they wanted to change cooks—the rice was not boiled to some one's taste.

Sometimes the babel of tongues on the deck of the Junk comes back to me in my dreams and I hear a "Harbor Meester" talking Dutch to Daan Hubrecht; the men and boys, laden with plants, coming up the gang-ladder, jabbering Malay or some native dialect, trying to effect a trade with Hugo; Ah Gunn giving orders in Chinese, and Mrs. Archbold calling Fenton in English. I was glad I understood something of three languages, but annoyed that I knew no Chinese. I am afraid I have little patience with those who would do away with all languages but English; they would destroy one of the most interesting contrasts of travel.

On the evening of the ninth of January we left the *Casiana* and went over to our cabins on the *Chêng Ho* for an early start next morning. As Marian and I reflected on how we had come into the country on a freighter and were being escorted out of it by its President, we decided we had not done so badly.

When we had unpacked our many cases and I laid out my new *Atlas van Tropisch Nederland* on the chart table, and Kilkenny and Fant brought out their "East Indian Pilots" and hydrographic charts, the discrepancy between my book knowledge and their acquaintance with the things of the sea was most apparent. They threw into the discussion the matter of currents and prevailing winds and anchorages; for the waters are very deep around most of the islands, and the distances between well-sheltered ports and ones with good water supply had to be considered. We would need to replenish our oil for the diesel engines at intervals; and even bank facilities had to be thought of. To sail from one island to another at will seemed simple enough on the map, for the distances between them are not great; but where there are few lighthouses, sometimes none of any kind, anchorages must be found before dark, and anchoring in sixty fathoms of water is not always a simple procedure. It became quite apparent that, as was the case with Mr. Armour's *Utowana*, we

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should have to go from island to island by agreements arrived at a day or so ahead.

It was decided that we would make a quick run through the southern islands of the Philippines to Mindanao, the second largest of the archipelago, during which we could get familiar with the *Chêng Ho* and perhaps pick up seeds of some of the palms known to occur on various of the islands.

We got away at daybreak. It was a perfect morning and our spirits ran high. At last we were off for the Moluccas.

Soon we were abreast of the tiny island of El Templo, which looked so attractive that we could not resist stopping to take our first look around. Being unable to get very near in the launch, we waded ashore in the warm water.

We found no palms. But there, on the rocky shore where we landed, stood a handsome tree with large, glossy leaves, such a tree as would grace any seashore in the tropical world, and I was looking for just such things. It proved to be a persimmon, *Diospyros maritima*, and we gathered a quantity of its small dark fruits. Mr. Jordahn, of the Fairchild Tropical Garden, has just telephoned me that he liked the looks of the little plants of this seaside persimmon as soon as they showed up in the slat-house here, and that now there are several of them making a splendid growth outside in the Garden itself.

Most of the species of persimmons I was familiar with have edible fruits, and I didn't stop to think that the Japanese use one for tanning their bark papers, and that Joseph Rock sent me another from Siam, with the note that the Chinese send their silks across the border to have the Siamese dye them a fast black with its fruit juices. Had I remembered, I would surely have cautioned Fenton when he started to get out the seeds. As it was, his hands became as "black as your hat." Worse than that, they were soon covered with dozens of blisters, which gave him the greatest discomfort. The blisters might have made him a casualty had not Hugo run threads soaked

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in iodine through them, leaving the two ends of the thread as wicks to drain them—a useful technique I have never seen mentioned in any book nor seen in any movie on first-aid.

The ten days we spent going South through this enormous archipelago, making stops on only six islands, could give us a mere glimpse; but that glimpse convinced me of the wealth of plants to be found there and made me want to go back.

I remember with pleasure the Krai Krai river on Biliran Island, where the nipa palms were growing beautifully. Mrs. Archbold wandered out under an immense *Avicennia* tree which grew among the nipa palms, while we were photographing the strange, underground stems of this unique palm and watching some of the women sewing the leaves into thatch for the roofs of their houses. In our house at home we have used some of the woven “bilik” made in Java out of the smooth outer skins of the midribs of this palm, and Mrs. Robert Montgomery has lined her library with some I imported for her; so I have been interested for years in the nipa palm. A few sturdy specimens of it are growing in the Plant Introduction Garden on the shore of Biscayne Bay. Perhaps stretches of it, like those along the Krai Krai, will sometime grace our mangrove-lined shores.

At Buria one afternoon, some schoolboys showed us how to pull the fibers from the fresh leaf-stem of the Buri palm to use in making the finest hats in the archipelago. We have some of these hats now on exhibition in the Montgomery Palm Museum, alongside the pretty furniture which I have mentioned before, made from the same Buri palm. I am glad to say that this giant palm has decided to make its way in South Florida gardens. *Corypha elata* is its scientific name.

At Cebu, a nice old town, in fact one of the oldest in the Philippines, we found the market filled with fruit novelties. Being something of a “fruit bat” myself, it was a delight to find that Mrs. Archbold’s taste in fruit was catholic in the extreme. There are not many persons with fewer prejudices toward foods or with greater curiosity about them, and it was always a pleasure to bring her something

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she had never tasted before. In this respect she reminded me of Allison Armour, who would get his chef to cook and serve anything new—even to an armadillo. The durian, which most people think unfit to eat, she adjudged delicious—a discovery which Alfred Russel Wallace also made, and which led him to remark that it was worth a journey to the Malay Archipelago to taste that fruit.

Polly Curran and Bill Yankee, whose wedding we had attended in Manila, had now come to live in Cebu. They piloted us about and we got all sorts of baskets made of palm fibers for the Junk. Basket-buying became almost a passion during the trip; for there seems to be an endless variety of form and detail, depending on the kind of palm used and the fancy of the basket-maker.

We left Cebu at dusk, headed for Zamboanga, a run of two days and a night. Marian likes to tell of being awakened at dawn next morning by the stopping of the engines. She went on deck to see what was the trouble.

"What is happening?" she asked Daan, who was up on the high poop, steering.

"Well, Dr. Fairchild came up on deck a while ago and asked Kil what those lights were in the distance, and when Kil said it was Dumaguette, the Doctor said, 'There's a man in there I'd like to call on. Can't we stop and see him?' and Kil said, 'All right.' So here we are."

The man I was so anxious to meet was Dr. J. W. Chapman, an intimate friend of Morton Wheeler and, like him, a zoologist and student of ants. I had learned in Cebu that we would pass right by Silliman University. When at dawn I saw the lights of that American institution beckoning us from the shore, I felt that we could not pass by without stopping.

It has been my pleasure to call upon many scientific men in their homes in many parts of the world, but the day spent with Dr. and Mrs. Chapman stands out as particularly delightful. To find a man of such erudition and brilliance teaching advanced zoology to Filipino students, and to hear him tell of finding among them capable

We Set Sail in the Junk Chêng Ho

observers with good memories and a keen interest in the problem of evolution, was to plant even more firmly in my mind a realization of what talented American teachers have done by devoting their lives to encouraging a taste for science among the Filipinos.

We could have spent a fascinating day in Dr. Chapman's laboratory, looking at his rich collection of sea and land animals, insects, and so forth; but naturalist that he is, he insisted on showing us the country back of the town. In his Ford we drove over quite passable roads to their "Camp Lookout," one of those paradises dreamed of by naturalists, a thatched bamboo house right on the edge of the untouched jungle on a mountainside, with a native family to take care of it. It was here that he made some of the studies of ants which attracted Wheeler's attention, and it was Wheeler who made me conscious that through studies of these social insects man may come to understand his own social organization better—perhaps may come to realize that he is not the only worth-while living thing on the planet.

As Dr. Chapman began to show us some of the strange forms around his little house, one big black ant stood on its head, and when I tried to get a near view of it with my hand lens, shot at me a stream of fluid that smelled of formic acid. We saw another species, which I shall describe later, that made its nest by "sewing" leaves together.

Before the afternoon was over I was almost ready to abandon the Junk and settle down with Chapman, in a life that was less a matter of watching the doings of other human beings and more the observing of entirely new and strange forms of life.

X

Zamboanga and Mindanao

THE sea breezes which blow across Zamboanga Peninsula make life in the town itself quite comfortable, reminding me of our sea breezes in South Florida. In fact we felt particularly at home among the coconut plantations which lined the coast everywhere and furnished the nuts for Fritz Wooster's large factory, where great boxes were being loaded with glistening white coconut "shavings" to be made into desiccated coconut for the Boston market.

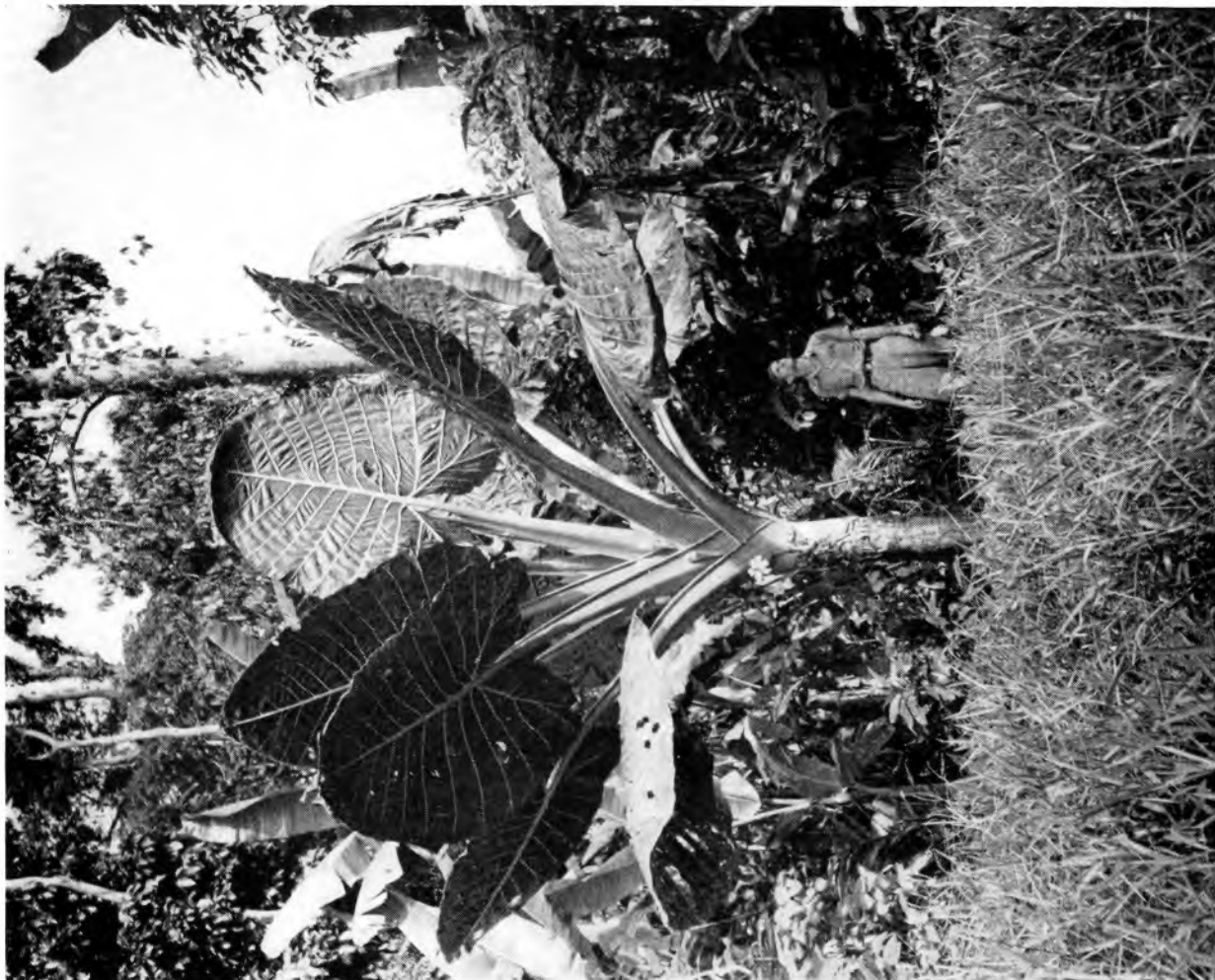
The Woosters invited us to luncheon at their charming house, which was made the more interesting by the Chinese objects of art excavated by them around Zamboanga, and by their beautifully arranged collections of shells. Ned and I disgraced ourselves by arriving for lunch over an hour late, but we had made off up the coast, where I had been told that the "Marang" grew, a tropical fruit about which I had heard much, but which I had never eaten. It is a relative of the bread-fruit and the jack-fruit, and is a native of the Philippines and Borneo. This species, *Artocarpus odoratissima*, belongs to a genus of sixty species, of many of which the fruit flesh or the seeds, or both, are recognized as excellent food by those who know them. It seems strange that so little has been done to improve them, aside from what the Polynesians have done with the bread-fruit.



There are many excellent tropical fruits waiting for the plant breeders to improve them.
The "Marang" of Mindanao is one of them.

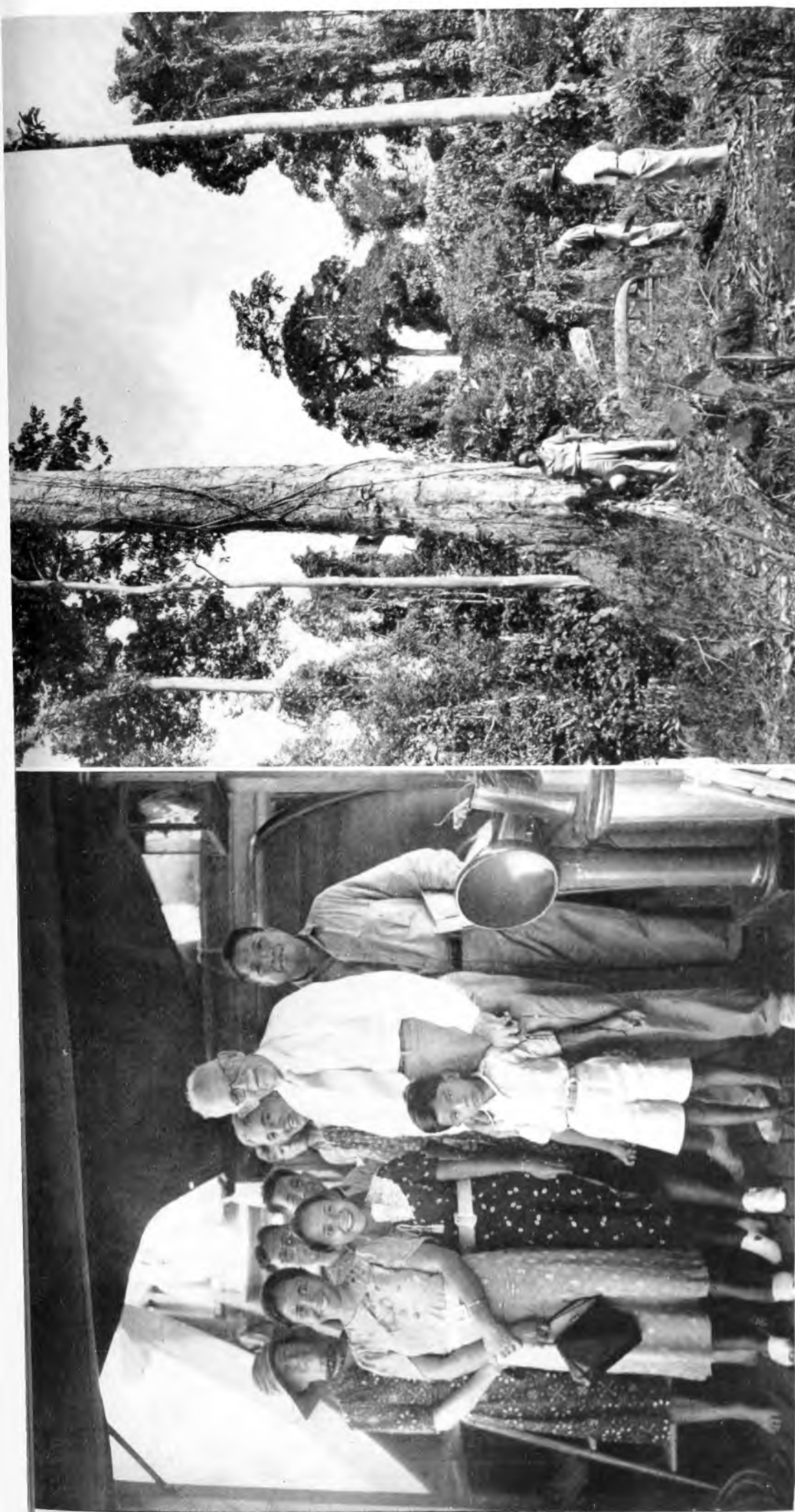


The glistening white "fruitlets" from a marang fruit are sweet and juicy.



Right: The Calla lily is the aroid most people know, but this is the giant of the family. The leaves of *Alocasia macrorrhiza*, like those of the Calla, are horribly acrid. It grew in a wet spot on the Turno place on Mindanao.

Left: The curious, fleshy flower produced by this giant aroid.



Right: At Mr. Turno's lumber camp in Mindanao, we searched in vain for ripe nuts of this tropical chestnut, *Cas-tanopsis philippinensis*. *Left:* I took a great fancy to Ernesto Turno, whose interest in everything was phenomenal. He came with his mother and her friends to see the Junk at Parang.



The market used to come to the Junk, ready to trade chickens, shells, seeds, coconuts, eggs, baskets, fabrics, for tobacco, empty bottles, tin cans, cheap jewelry, matches, or little bottles of perfume.



Left: A man of Tahoena comes aboard bearing in his right hand the strange flower of *Boerlagiodendron*, in his left Nipa palm fruit, and followed by a friend with a cluster of palm fruits. *Right:* The swarming of children around an ice-cream freezer is nothing to the way these boys of Sangihe fought for a ripe Durian.

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It is curious that every educated person should have heard of the "Mutiny of the Bounty" and, merely as incidental to the sea story, should know about bread-fruit, probably without knowing that four years after Bligh was set adrift, he made another trip to the Marquesas and successfully introduced bread-fruit trees into the West Indies. Could we infer from this that most people are excitedly interested in what other men do that is dangerous, but only mildly so in the plants they grow?

As Ned and I drove towards the Patalen Plantation where the marangs were said to be growing, we saw, in a low spot by the sea, a most amazing tree in full bloom. It had palmate leaves many times larger than those of a Castor-bean tree and, at its very top, one enormous flower cluster, as big as a bushel basket. The cluster looked like some gigantic pin-cushion stuck full of yellow-headed pins; the cushion being made up of masses of purple-brown fruits, while the pins were individual clusters of bright orange flowers. To a botanist it was an amazing sight to see at the same time, ripe fruits and flowers full of pollen, *in the same cluster*.

It was not until sometime later that I found out that this tree was named *Boerlagiodendron*, after Prof. Borlage whom I had known in Java in the nineties, and that the Italian botanist, Beccari, had studied it in Borneo. Beccari had seen wood pigeons feeding on the purplish fruits, which he discovered were entirely seedless. He called them "false fruits." He pointed out that they were situated below the real flowers (the little yellow flower clusters which resembled pins on a pin-cushion) at just the right distance so that while the wood pigeons were eating the false fruits, their breast feathers would be rubbing the pollen off the real flowers. When the pigeons flew to another tree of the same species, in feeding they would dust the pollen already on their breasts on the real flowers there. These have both stamens and pistils, are "perfect," therefore—but apparently require pollen from other flowers or even, perhaps, from other trees. The assumption is that they are not fertile to their own pollen. The real *seed-bearing* fruits develop only after the false

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fruits have been eaten or have dried up. Explain, if you can, how a tree came to develop things that look just like fruits, but without seeds, for the evident purpose of attracting birds whose feathery breasts will rub against the flowers destined to produce fruits with seeds. So far as I know, this adaptation to ensure cross-pollination is unique.

A little man with a bolo, who came walking down the road, offered to climb the tree and get the flowers and fruit for me. Six months later, on our return to Zamboanga, I made a second trip to the *Boerlagiodendron* to secure more seeds, and again a little man with a bolo came walking along the road and offered to get me the seeds. Said he to the driver, "I climbed this same tree a long time ago for some Americans who wanted the flowers and now I climb it again." He lived far away in the hills, and each time just chanced to be passing along the road. It was one of the many curious coincidences that have happened to me in my life.

All my seeds were very small and poorly developed, and but two little plants have survived in the greenhouse here; yet, if they grow and flower, botanists may make pilgrimages to see them.

Ned and I spent the forenoon with the owner of the marang trees, Mr. J. O. Galle. We ate some of his ripe fruits and decided they were worthy of serving on any table—delicious, shiny, juicy bits of fruit flesh, with a sweet and characteristic flavor. But, although the jack-fruit, its cousin, grows in Florida, the marang is perhaps too tender.

A run of a day and a half across the Moro Gulf brought us into the pretty little bay of Parang, North of Cotabato, at one end of the highway which runs straight across Mindanao to the town of Davao, center of the great Abaca, or manila hemp industry, which we wanted to see. There had been much talk about the Japanese infiltration into Davao, and those who should know had told us that there were more Japanese in the island of Mindanao than there were Americans in the whole of the Philippines. My first knowledge of

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the situation had come to me years ago through Harry Boyle, who had been sent out to Siam to study the Siamese pomelos for the Department of Agriculture and then had gone on to Davao, where he settled down as the Abaca buyer for some Ohio rope manufacturers. Harry Boyle watched the buying up of the hemp plantations by Japanese, and as early as 1925 he became convinced that they were subsidized by the Japanese government. But his repeated protests to the bureaucrats of Washington brought only shrugs of the shoulder. How could provincial minds be apprehensive regarding the ownership of plantations of a plant they had never seen and knew little about? Particularly as they were all asking "Do you think we ought to keep the Philippines anyway?" Too few people had ever been to the Philippines and many of these didn't even know how to spell the name. Harry Boyle knocked at the door of the Navy, telling them that the Japanese now owned the fibers out of which all their manila ropes were made, but in vain. Fortunately, however, Harry Edwards, fiber expert of the Department of Agriculture, succeeded in getting the principal varieties of this banana-like plant, *Musa ensete*, to grow near the Panama Canal Zone, where they have done well; and from this stock, young plants have been propagated for extensive plantings in Central and South America. At one time Abaca was practically a Philippine monopoly, but that day has passed.

In Zamboanga a report had come to us through the Army officers that 20,000 Japanese women and children had been evacuated from Davao, and it was assumed that this fact had a sinister meaning. Whether we had any reason to be in the least nervous about visiting Davao in a yacht built on the lines of a Chinese Junk while Japan and China were at war, can never be answered. In the light of subsequent events, it seems probable that we might have been sunk, and the explanation given would have been that we had been mistaken for just another Chinese vessel, such as already had been sunk by the hundreds.

Anyway, we decided to go by car, and spent a long day coming

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and going. We lunched at the hotel in Davao. Its owner had a "monkey eating eagle" in a cage, an eagle whose face was so fantastically diabolical that I went back to look at it again and again. A wild insanity seemed stamped on every feature.

The town had the aspect of a large pioneer community, unattractive but growing, a town where some people at least were making money. Schools were filled with pupils whose recitations we could hear through the open windows. The only person I could find who knew anything about plants was Agapito Canabre, the District Forester, after whom Dr. Merrill had once named a new species. He has never forgotten the honor. As he said, in a note he sent to Dr. Merrill at my suggestion: "I have not forgotten the spirit of collecting botanical specimens whenever I have the opportunity to do so." I thought it significant as showing again that the scientific men who went out to the Philippines in the early days have left lasting impressions of their stay there.

Two showy plants, souvenirs of that trip, are now large, attractive plants here in southern Florida. One is a giant aroid, *Alocasia macrorrhiza*, with a trunk ten feet high and leaves eight feet long, a mammoth of the genus; and the other, *Callicarpa* sp., is a stunning tree with fragrant, lavender flowers followed by brilliant scarlet berries borne in great masses, like elderberries. It is only two and a half years since the seeds arrived here, and already this summer, I was shown a tree twenty feet high, covered with berries and alive with birds, just as this tree was, beside the road from Cotabato to Davao.

We seemed far away from home in the little harbor of Parang, but one morning as Hugo and I were packing up our seeds and wondering how we could get them back alive, two Navy seaplanes settled down on the water not far from us. Their pilots came aboard. "Anything we can do for you?" they asked. "Yes," we said. "Take these seeds to Manila and deliver them to the Clipper for 'Frisco.'" In nine days those seeds were being planted in the Montgomery Palmetum in Coconut Grove, Florida. Twice Army and Navy

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planes came to our assistance, while throughout the whole course of the expedition the Pan-American Airways expedited in every possible way the shipments of our living seeds across the Pacific to their new country.

This air transport necessitated a new technique in the packing and shipping of material—light bags of tough, waterproof cellophane, small quantities of moistened peat, careful cleaning of every seed, and judgment as to the amount of moisture in the peat with which the seeds were surrounded. We packed the seeds just as soon as we could after they were gathered, never allowing the fruits to mould if we could help it, and these packeted seeds, when stored in the drawers of the cabinet in my study, usually kept without rotting until such time as we could get them to Manila and to a Clipper plane.

It was January 24 when we motored from Parang to Davao, and stopped overnight in the comfortably equipped lumber camp of Mr. B. Turno, at Marasila, where we were entertained by Mr. and Mrs. Turno and their charming little boy, Ernesto. The camp was in the center of a dipterocarp forest, with several roads leading away into it, and we had a great time collecting palms. Four species of *Pinangas* were gathered. Few species of this genus have been tried in Florida. They are rather small, with graceful, irregular leaves and fruit clusters of a striking, lacquer-red color, and I was anxious to get as many species as I could, to make sure that, in time, some of them would grace our dooryards here.

There is a tropical chestnut at the Turno camp, a tall, handsome tree, *Castanopsis philippinensis*, of which years ago, when the chestnut blight struck down our American species, we had tried in vain to get seeds. Our efforts to find a quantity of good seeds on Mr. Turno's tree, unfortunately, failed as well. But we got a few and have a single plant in the slat-house. It may be a fantastic thought—but who knows whether crosses between this tropical chestnut and the temperate region species might not be successful? I hope some day it may be tried.

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With the pandanus we had better luck. Already, plants three or four feet high are growing in Florida gardens. As they are long-leaved and quick-growing, and bear decorative, bright-red cluster-fruits they are sure to find their place in our ornamental horticulture. I was disgusted to find, however, that the plants of the species of pandan which Mr. Turno and Prof. Curran both had growing beside their doors, the leaves of which they put in the pot and boil with the rice to give it a fine flavor, died on the way home.

Until one has slept on the soft pliable mats made of split strips of the pandan leaves, he cannot appreciate the rôle that these curious plants play in the economy of the Malays and the Polynesians. That pandan mats are cooler to sleep on than sheets, is an observation Marian and I verified in our narrow bunks and on the deck of the *Chêng Ho*, where our mattresses were laid whenever the weather permitted. Practically no mosquitos or sand flies bothered us during the cruise, so we could sleep out of doors.

There was another lumber camp at Port Lebak, down the coast from Parang, and the chances were that we might pick up some palm seeds by stopping over; so we anchored there one night after dark. This was against Kilkenny's general practice, for with no adequate lights on the shore, with charts which are often inaccurate and with no personal acquaintance with the anchorage, there are always risks of losing an anchor, or of drifting ashore in case the wind rises in the night.

The tramp along the railroad track into the virgin forest yielded a dozen species of plants of which seeds were sent home. A curious passion-vine, which had become a weed over the bushes there, but which we liked because of its very sweet little fruits, is already being enjoyed by Florida children, and a species of *Premna* is already fruiting beside the one whose blackberries our mocking-birds love, promising to rival it as a bird-food tree.

Hugo had picked up the information that there were immense trees of *Eucalyptus philippinensis* growing somewhere in the dense forests along the Palembang River. So next day we went to Milbuk

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and spent the morning hunting for them, in the hope that we might get seeds of this rare tropical species. Mr. Urbano de Cantara, the Forest officer in charge of the area, guided us through the steaming rain forest, splashing through the mud, as one usually must, until Mrs. Archbold, Marian, and I were left behind, letting Hugo and Cantara push on to see if they could find any considerable stand of the tree.

We took photographs of the trees we had already found. While the largest one we saw was a mere pigmy, compared with the giants of Gippsland, in the Victoria forests in Australia, yet it had a trunk so large that it dwarfed the woodsman standing beside it. Its interest for us lay in the fact that, unlike the Australian species, which live under semi-desert conditions, this one occurs in a dripping rain forest. Furthermore, it is the species which grows farthest North and farthest away from the recognized home of the Eucalyptus. It had never been brought into cultivation, and the trees under which we hunted for seeds were unfortunately not in fruit. A single fruit with ripe seeds would have sufficed, for the seeds are minute. It is one of the many plants for which I should like to go to the Philippines again.

Another tropical species, *Eucalyptus alba*, which Dr. Treub sent me from Timor, has always had a special interest for me, not only because it proved well adapted to Florida conditions, but because it made a record in the island of St. Lucia, B.W.I., and also attracted the favorable attention of Dr. Navarro de Andrade, the great eucalyptus expert of São Paulo, Brazil.

It is a primitive country, this West coast of Mindanao. We saw a few Mongobas, as the inhabitants are called—gentle, agreeable people who speak their own dialect. They were living in a nipa-thatched shack built on tall posts in the middle of a little clearing, and were busy husking corn gathered from the field about the shack. I was reminded of the little cornfields in our own South. Corn appears to be one of their chief crops.

The regularity of the rainfall and the fact that this coast is not

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visited by typhoons, for like Borneo it is "below the wind," make a luxuriant vegetation possible. I could understand how the Mr. Neibert whom I met in Zamboanga could pick out Milbuk as the place in which he wished to end his days.

XI

We Drop Off into Deep Water

IT WAS on the afternoon of January 26 that we sailed from Milbuk, and heading South, left the Philippine Islands behind us.

It is exciting to cross into the confines of a new country when you know that the people who next come on board will greet you in a different language and will have the right to treat you as "foreigners." But when you have been able to learn practically nothing about the islands you are headed for, the strangeness of the experience is greatly enhanced.

The Sangihe Archipelago is nearer Manila than Puerto Rico is to Miami by air, but so far as any intercourse is concerned, it might be almost anywhere. When we left the Philippines we dropped off into deep water, literally and figuratively, for the islands which we were to visit next were volcanic, and volcanos rising from the sea generally mean deep anchorages. For the next five months we were rarely out of sight of at least one volcanic cone. As each one is marked with a red dot on my atlas of Tropical Netherlands, the page reminds me of a case of prickly heat. No other area on the planet shows more evidence of the molten rocks over which the "thin crust of the world" is spread.

Sangihe, our first little island, with its town of Tahoena, is only twenty-five miles long and ten miles across. Put it down here where I live in southern Florida and it would reach from Coconut Grove to Fort Lauderdale, and would spread out only ten miles into the

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Everglades. Yet it has its own volcano, Goenoeng Awoe, which rises 6,000 feet above the coconuts on its shore. We had to take this one on faith, for it was covered with clouds all the time we were there.

To a land-lubber like me the matter of anchoring such a small craft as the *Chêng Ho* seemed easy: just throw over an anchor and there you are. But when I saw the dark brown volcanic sands of the shore and noted how the anchor cable, which the Chinese crew were letting out forwards, spun out indefinitely, I realized we were hunting for an anchorage on the submerged slope of a volcanic cone. And we lost the anchor. It lies at the bottom of the harbor of Tahoena.

It was evident that visitors to Tahoena were rare, because hardly had the launch carrying the ladies touched the beach before swarms of children crowded around, shouting and screaming with excitement, and escorted them in a triumphal procession into the little town.

The Radja and his wife came out to call at once, and when they learned we wanted seeds of palms, the Radja promised to send us specimens of his favorite "Lindoeng" palm. When his men brought it up the gangway ladder I thought I had seldom seen a more decorative thing than the immense fruit cluster with its thousands of black fruits set off against their claret red stems. It is a species of *Pinanga*.

What a strange, eerie place a tropical village is after nightfall, when with no street lights and only the faint glimmer of oil lamps from open doors to guide your steps, you flounder about its irregular streets! We groped our way that evening to a special function. The Resident, the official representative of the Netherlands Government, had died while on his leave, and, according to a very old and practical custom, originating when the transport of furniture and the like was very expensive, his effects were to be auctioned off and the money sent to his wife. The Assistant Resident invited us all to the auction, which was to take place that very night; there we could meet most of the officials, six or so in all, and their families.

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It was a jolly party, for most of those present spoke English—educated Netherlanders command three languages—and as the late Resident had travelled widely over the archipelago, the ladies found his collection of native hand-woven “kain” quite irresistible.

For so small a group of islands, the Sangihes are pretty well populated, having 135,000 people, including 65 Europeans and 2600 Chinese. The natives, like those of the northern part of Celebes, were Christianized about a century ago, but whether, like the latter, they were once head-hunters, I did not discover. While Malay is the lingua franca of this whole vast archipelago and the one language commonly taught in the schools, a host of distinct languages and dialects are met with, and although I could converse with the native Radjas and officials and schoolmasters, the men in the villages and in the bush understood better the universal language of signs.

Realizing I might have difficulty in explaining to the natives I met what I was looking for, I hit upon the idea of putting some palm seeds and flowers and a palm fruit in a transparent cellophane bag and taking it with me. Pointing to the seeds and waving my hands and using the Malay words *di mana ada?*—“Where are?”—generally led to my finding some one who would show us which way to go, or who would accompany us. In this way Hugo and I found, on the first day of our stop in Tahoena, two beautiful and rare palms. One of them was as tall and straight as a Royal, with superb clusters of leaves at the top, and fruits two inches long, a beautiful lacquer red in color. It is called “Kavesu” in the Sangihe islands. Hugo got permission to cut down a specimen in a native’s yard—quite a performance, as we were up to our ankles in mud and the rain was coming down in torrents. The other, “Sago Barok,” was a rare, spineless sago palm from New Guinea, where it is felled for its sago. Although only recently introduced into Sangihe, this species, *Arenga microcarpa*, already was furnishing a considerable portion of the sago consumed there.

As we waded about in the muddy lowlands and found the other, the true species of sago, *Metroxylon rumphii*, cultivated every-

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where, I realized that we had entered the outskirts of the region where a tree starch furnishes the chief food of millions. It is a curious fact that on our side of the world millions of children have wondered at the little round balls in their sago pudding, called "fish eyes," without having any idea that they are made from the starchy pith of a palm. As we proceeded further into the archipelago we saw more of the sago, and were able to study its production.

By the time we had secured our seeds the wind had risen. Rollers were breaking on the strand, and we saw the fishermen paddling their catamarans for the shore; so we put our specimens in the bottoms of a couple of these fascinating craft with outriggers on each side, shoved off through the rollers, and were paddled to the Junk.

I forebore taking along the fruit of a durian that had been given us because it had already been five days off the tree and smelled to Heaven. By this time it would have also developed its intense flavor of garlic, and I was afraid that even Mrs. Archbold, with all her love of new fruits, would not be equal to trying it.

One of my objectives was to get seeds of the Oriental mangroves. Most visitors to Florida become fascinated by the curious mangrove swamps which extend for miles along the coast, forming forests of considerable extent, notably in the "Ten Thousand Islands" of West Florida and along the Shark River, the great fishing-ground for tarpon. The stilt roots which shoot out in all directions from the trunk, often as much as ten feet above the mud, and curve downward into it, anchoring the trees securely, are most difficult to climb over. They cannot be cut easily, and your muddy feet slip off them continually. You cannot walk erect through a mangrove swamp; you must use both hands and feet. Indeed, mangroves form a barrier as difficult to get through as a barbed-wire entanglement. Our troops in the Solomons and elsewhere in the tropics will have to invent new ways of getting quickly through the mangrove swamps that line so many of those coasts.

The root systems and their long, hanging fruits which drop like plummets into the sea, floating about until they take root in a muddy

We Drop Off into Deep Water

shore, make mangroves striking curiosities of the vegetable kingdom. How it has come about that the trees of the western hemisphere and those of the eastern world, though looking much alike—stilt roots, plummet fruits, and all—are distinct species, is explained by the theory of isolation and natural selection.

For centuries, mangrove bark was used by tanners, and doubtless would still be used had chemical tanning not been developed. In the Orient it is still valued for this purpose, and the stunning henna color of the *Chêng Ho's* sails was produced by tanning them in the "kutch" of mangrove bark. But it was because of the wide interest of botanists, rather than of tanners, that I was keen to get seeds of these mangroves of the Oriental tropics and establish them on the Florida coast. So, one morning early, we set out, in one of the specially designed motorboats which the Junk carried and which proved ideal for collecting along the shores, to explore the mangroves of Dago bay and its tidal rivers. It was a completely fascinating experience.

We entered the dark forest where a death-like stillness prevailed, and began to compare the stilt roots of these species, *Rhizophora mucronata* and *R. candelaria*, with those of our own American *R. mangle*, finding them curiously alike. Presently there began to appear here and there on the trunks of the trees, as though fastened by hand, the strangest looking "air plants" imaginable. One of the party said they looked like ducks from which the feathers had been plucked, hanging head downward with their necks stretched out and a bunch of feathers still attached to each head. In a moment Hugo had one of them in his hands, but swarms of very small but very ferocious ants poured out of the big tuber all over his arms, and I realized we were seeing one of the ant-inhabited *Hydnophytums*. Slicing it through with a knife, we saw that the tuber was filled with canals which were alive with ants. Had the ants made the canals or had they simply found out that they were there and moved into them? An elaborate theory of symbiosis, or cooperation between the plant which enjoyed the protection of the stinging ants and the

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ants which found the tuber an ideal home, was at one time built up by botanists; but when Treub found that seedlings grown away from any ants made typical canals, the case was not so conclusive. I hung up some of these interesting plants in my laboratory on the Junk and the ants never annoyed me. Pretty little white flowers formed on that portion designated as the "neck," and later, fruit formed also. But none of the seeds I sent in grew. If they could once be established in our mangroves they should do well.

Scarcely had we photographed the hydnohytums on the trees and drowned out the ants in our specimens by trailing the large tubers in the stream, when we noticed, along the low bushes on the shore, what appeared to be balls or clumps of fresh leaves curiously fastened together. They proved on examination to be the nests of an amazing species of ant, *Oecophylla smaragdina*, which makes its nest by fastening the leaves together with the sticky silk which the larvæ of the colony usually exude to spin their cocoons. Certain workers, lined up along the edges of the leaves, working in unison, pull and hold the edges together, while others, holding the young larvæ in their jaws, squeeze out the glue-like silk from their silk glands and passing them like a shuttle, back and forth between the leaf edges, fasten these together with a web which is so tough that when it dries you can hardly tear it with your hands.

I know of no more fascinating story of the intelligence of the social insects than that of Doflein, quoted by Morton Wheeler in his book on ants, describing the way a colony of these ants repaired a rent he had made in its nest. One cannot read it without wondering how such perfect cooperation between myriads of individuals, apparently wholly without a "leader," is brought about. If one seeks for analogies he might find them abundant in the world of the ants. Is every ant imbued with the desire to work for the good of the colony? There seem to be no dictators anywhere about. The kings and queens produce the young but have nothing to do with the repairing of the nest, at least so far as we can see.

I was anxious to get seeds of all the mangrove species, but espe-

We Drop Off into Deep Water

cially wanted the red-flowered *Bruguiera*. And there, in the swiftly flowing stream, stood beautiful specimens, as pyramidal as Christmas trees, quite without stilt roots, each fruit having its red flower at its base. Two lusty plants of it are growing now along my canal in a patch of mangrove near the bay. If they fruit, perhaps some day they will brighten our coasts with their flowers.

XII

The Isle of Singing Children

WE were planning to make our next stop at Manado, on the tip of Celebes, but Captain de Vries of the little police boat which was anchored in the harbor when we arrived, urged us to stop at Siaoe, a small island that appeared as a tiny dot on the chart, and about which we had found nothing in our literature. His advice put us in the way of an interesting experience.

It was half-past-four in the afternoon when the outlines of a volcano nearly 6,000 feet in height became sufficiently clear to show us that the island which it dominated was covered with coconut palms. In the afternoon light, the valleys and ridges which furrowed the slopes resembled the gigantic buttresses of some gargantuan tree-base, rising from the sea; with the coconuts like waving grasses clothing them. It was a magnificent sight, and our arrival at Siaoe in the late afternoon and our departure from it, late on another afternoon, have left indelible pictures in my mind. Having spent my youth on the Great Plains where the horizon is often a straight, unbroken line, I have never lost my feeling of wonder at the sight of giant cones of land rising from the sea with masses of smoke and steam billowing from their tops a mile or more above my head. Goenoeng Api and Tamata, the one 5,800 feet high and the other 3,600 feet high, had been thrust up from the sea bottom without bringing any land with them; just enough had formed to make a rim for coconut growing. Imagine two such giants in the District of Columbia!

In the distance nestled the tiny village of Hoeloe, and before sun-



Strangely inhospitable but yet fascinating places to enter are the Mangrove swamps, where a deathlike stillness prevails among the dark stilt roots and gray trunks.



Our approach to Siao, an island which has left with us unforgettable memories of its smoking volcano, its coconut groves, its Papaya-leaf eaters, and its singing children.



The Radja of Siao and his jolly wife, who eat Papaya-leaf greens nearly every day, cannot understand why people in other lands eat only their fruits.



These boys of Siao followed us up the hillside, singing in chorus at the tops of their voices. A crowd of singing girls followed us too.



Working in unison, a colony of ants, visible in the photograph, drew these fresh green leaves together and fastened them with the sticky silk of mature larvæ.



Right: The strange Hydnophytum plants of the mangrove swamps, honeycombed with galleries inhabited by stinging ants. *Left:* Boerlagiodendron (page 81) has immense leaves with curious bases which may move the leaves up and down, and "false fruits" at the bases of the flower heads.

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set the Junk was tied up to a pier where the boys of the town were swimming.

The first walk on the shore of an island gives one some idea, favorable or unfavorable, of the people who live on it. The children of Siaoë captured us at once, for like those of Sangihe, they were friendly, and as they followed us they sang. Indeed, singing seems to be a specialty of these islands, for a song festival was given in our honor by the Radja. During the evening each guest was expected to get up and start singing a song, picking out two or three others to sing it too. I was not present, but Marian reported that when her turn came she couldn't think of a single song, and to cover her embarrassment, the Radja's wife started "Merrily we roll along" and the whole company carried it on in English. What made it surprising was that the guests were all natives of Siaoë. There wasn't a European on the island.

One Sunday morning Ned and I started to go around the island, and were followed by forty boys and girls who kept singing in chorus all the way. I could not help wondering if they were some escaped Sunday school. There was a natural charm and spontaneity in their singing which I have never met with anywhere, before or since. I shall never forget the singing children of Siaoë.

In the early days when we of the Department of Agriculture were encouraging the culture of the papaya, *Carica papaya*, as a table delicacy, I read in Dr. Koorder's *Official Botanical Trip Through the Minahasa Region of Northern Celebes* the following: "It is very curious that the Minahasers always feed the fruits of the papaya to the pigs, and eat only the leaves." Having an abundance of leaves in our garden at the time, I proposed to Marian that we have some sent up to Washington for trial. I cooked some myself, but finding that they were very bitter I changed the water several times until the bitterness was reduced. Then we ate them and found them very good. My friend the noted chemist Dr. Powers, to whom I told this story, asked for some leaves to analyze and discovered in them considerable quantities of the alkaloid known as carpaine,

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which is used sometimes in place of digitalis as a heart stimulant. "I wonder that you escaped," he said.

I had determined that if I ever got to the Minahasa region myself I would investigate this strange custom. While in Sangihe I had told this story, and learned that the people there, and also in Siaoë, used the papaya regularly for greens. I had it in mind therefore to ask Radja Parengkuan, on whom Daan and I called the first morning of our stay in Hoeloe, whether he ate papaya leaves.

The Radja spoke no English and not much Dutch, but we soon learned to understand each other in Malay, and as we were walking along I brought up the subject. "Oh, yes! It is a custom here, we all use the papaya leaves very frequently. The schoolmaster here will be having some for luncheon. Let's go in and ask him about it." We stepped into the house and the schoolmaster's wife showed me the pot filled with leaves, on the fire; there could be no doubt about its being used. Children and their elders were all eating it.

As we walked along, with a bevy of happy children following us, it struck me as worth while asking the Radja if Ned and I might take his picture proving that he ate the leaves of the papaya. When we returned to Florida we could publish it, and the papaya growers there would then believe Koorder's story. Radja Parengkuan took us home with him. There we met his wife, who was even jollier than he was, always laughing or smiling, and told her what we wanted to do. A servant brought in some cooked papaya leaves, half grown ones, and Ned brought his cameras, and we four had a delightful time arranging the pictures. The Radja was sincerely interested to know that in all other tropical countries where I had travelled, pretty much over the world, those who grew papayas did not eat their leaves. Of course I ate some of the boiled leaves too, even though I found them quite bitter; and I drank some of the even bitterer water which was poured off the leaves after boiling, because the Radja said: "You know, when I come home all tired out I often take a glass of papaya leaf water, like this." And suiting the action to the words he swallowed a whole glassful.

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I suspected that the children had to learn to like the bitter of the leaves—but where is there a child in America who liked spinach from the start? And is there any more bitter flavor in the world than that of the lupulin contained in the golden yellow glands of the hop flower which goes into all beers? I have never learned to like the intense bitter of bottled beers.

Upon my return to America, I gathered together all the literature on the subject of carpine to be found in the Washington libraries, and also got into correspondence with Merck & Co. They informed me that the alkaloid is present in such small quantities that one would have to eat forty pounds of the fresh leaves to get an undesirable toxic reaction. The latest work seems to have been done by a Japanese who tested it on the muscles of frogs and rabbits; and also on amoebic dysentery, for which he found it effective.

I know there are many people who will shy at the idea of even tasting the leaves of the papaya, after what I have said; but as they shake their heads they will reach for a cigarette.

The Radja was proud of the road that had been built around the island and took us over it in a bus. It was all too evident that the workmen, with only their picks and shovels, were having difficulty in maintaining it; when torrential rains swelled the brooks coming down from the mountains they swept the roadbed away. Only modern road machines could cope with such a task.

Ned and I found this out one morning when we hired a car, thinking to drive along the picturesque coast. We ended by walking much of the way, and soon abandoned the car on a hillside planted to what to me was a new crop. The children called it "Gedi," and it was evidently much used in the "sayor" or cooked vegetable dishes of the people. Ochse in Buitenzorg told me that it came from China; that there are many varieties of it in the Moluccas but that they have not yet been introduced into culture in Java. It is *Hibiscus manihot*, related to our common *Hibiscus rosa-sinensis*, as also to the Okra. It is an important vegetable.

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I could not find a single seed, and all the cuttings I sent home perished. But with the finding of this "Gedi" I woke up to the fact that we had entered the islands of "rice, salt and 'lablab' (vegetables)—and, for the better situated, some fish." Many thousands, in fact, live happily on nothing but rice and vegetables flavored with salt. These vegetable eaters of Siao were not the thin, emaciated people one sometimes associates with vegetarians. They were as fine physical specimens as any one could wish to see, and they all seemed to be singers.

While Ned and I had been poking around at sea level, Hugo had climbed into the extinct crater of Tamata, and one afternoon brought home a new and gorgeous Areca palm on his shoulder. He had found it in the center of the crater, where its stilt roots were buried in the moss-covered but well-drained soil. We had seen several fruit clusters of the Areca palms already, and never tired of their lacquer-red fruits produced in solid clusters. A two-foot specimen is in my slat-house and promises to survive.

Leading up from the shore to the Radja's house there was a fine avenue of shade trees, the glossy green leaves set off with quantities of bright red fruits. This was the "Kajoe Sae" from Java, *Mimusops kauki*, which he had planted there himself. Little plants grown from the seeds the Radja gave me have been distributed to members of the Fairchild Garden. Aside from making a handsome shade tree, it is closely enough related to the sapodilla, choice fruit of our gardens here, to be used by the Javanese as stock for their good varieties.

As the *Chêng Ho* bore us out past the smoking cone of Goen-oeng Api, and past Mt. Tamata, the sweep of coconut landscape was so beautiful, the memories of our stay among the charming people were so pleasant, that I think all of us felt we would like to return sometime to the island of the singing children. Are they still singing under Japanese invasion, I wonder? Where they came from, these light-colored, gay people, nobody knows. Alfred Russel Wallace has ventured the suggestion that they originated somewhere in the islands of North Polynesia.

XIII

Celebes and My Favorite Palm

THE Minahasa region of Celebes, where we arrived on February 5th, has been celebrated throughout the whole Malay Archipelago for the rapid progress which its inhabitants have made from savagery. Wallace's remark that "forty years ago the country was a wilderness, the people naked savages, garnishing their rude houses with human heads," was made eighty years ago, not so long after the cultivation of coffee had been started and the people began to turn into agriculturists. The story of their rise is spectacular and deserves a serious study by anthropologists.

In Buitenzorg in the nineties I had heard so much about the region, that I imagined it to be a naturalist's paradise. I forgot that the word "progress" in man's vocabulary involves the destruction of forests. So, when we anchored in the roadstead of Manado, where the swift current threatened to drive us against the long sea wall, and I saw a modern town of low, white buildings before me, and a German steamer near by being held in port pending the possible outbreak of war with Holland, the beautiful dream I had kept in my mind all the years vanished.

It was pleasant to see once more the wide, rambling type of tropical hotel, each room with its porch in front and, in the rear, its spacious bathroom, in the corner of which was the cement tank of cold rain-water and the wooden handled bucket with which you doused your body and made it shiver every morning and afternoon. The big screened beds with their hard mattresses were there. The great gut-

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ters down which the torrential rains poured every afternoon were there. The "boys" or "Jongens" in sarongs and with carelessly set "kain capellas" or turbans, answered to your call and came pattering along barefooted with the cold coffee extract and hot milk at day-break. Mangosteen and doekoe and strange, beautiful ficus trees filled the patios and shaded the porches. Cockatoos and parrakeets and macaws made a racket on their perches near the manager's suite. My Malay came back fast, and also the Dutch, which I used to rattle off; and they both dragged back, from the delightful days of the past, those quiet visions which often come in my dreams.

But there was no longer peace and quiet; there was no time to look at mangosteen trees, or study the doekoes, or play with the cockatoos, or even to chat with the manager, who had many stories of the early days to tell. For there was the *Chéng Ho* pulling at her anchors in the open roadstead. She must be moved around to a sheltered place in the Straits of Lembéh, twenty miles away. The telephone bell was ringing, and while it is second nature to telephone in English, it is something of an operation to telephone to a stranger in Dutch after not doing it for years.

And then there were calls on the Resident and other officials; and money matters to attend to at the bank; special permissions to be secured for travel through the islands; the hiring of vehicles and the purchase of local maps—all those things that eat up the precious days and leave one tired and confused at night.

We arrived at a time when the regulations of the Netherlands Navy regarding photographing along the coast were being revised. Ned, who had been wanting to get a photograph of the *Chéng Ho* against an appropriate background of volcano and forest, decided to take one of her in the Straits of Lembéh, where she had been shifted the day of our arrival. We assume that some Japanese fishermen of the fleet of power-boats that was operating in the Strait stirred up the policeman to action. Be that as it may, Ned was arrested at six o'clock in the morning and ordered to go with the policeman to appear before the Assistant Resident in Manado with

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his camera. It devolved upon me to explain to the official that Ned was the photographer of our expedition and that he knew nothing of the regulations, and so on and so on. It turned out that these regulations were quite new, and even the Assistant Resident was not aware of them; but they were stringent and necessitated a cablegram of explanation to the Admiral in Batavia.

What worried Ned was that his cameras might have to be sealed and sent to Batavia. This would have required weeks. A return cablegram, however, released Ned's cameras, and the whole incident was made a joke of around the "rijsttafel" luncheon to which the Resident and his wife, Mr. and Mrs. van Rhijn, invited us before we left. But we twitted Ned for some time about his ride, under arrest, from Lembah to Manado.

As I view the incident in the light of what has happened since, the important fact stands out that there was a fleet of high-powered Japanese fishing boats occupying the Straits of Lembah. Their brilliant gasoline flares lighted up the waters every night of our stay at anchor there. It was certainly an unguarded outpost, and whenever the black hulls of those swift boats passed before my port-hole they sent a thrill of apprehension through me.

Manado lies at the mouth of a river of the same name, near the tip of a narrow peninsula over 300 miles long and about forty miles wide. Along this peninsula are six extinct volcanos that tower 6,000 and even 8,000 feet in the air. On one side is the Celebes Sea, and on the other coast the Molucca Sea, with its gulf of Tomini or Gorontalo. It might be compared to the peninsula of Florida, or rather contrasted with it—the one a low flat plain, the other a mountain chain. Imagine if you can the various peaks of Mount Washington, Mt. Jefferson, Mt. Adams, Mt. Lafayette, etc. scattered along the coast of Florida, ten to thirty miles back from the ocean. So near to the equator is this peninsula that the telephone poles cast no shadows at noon.

Back of the modern town, with its paved streets and parks and government buildings, are two volcanos that have been active in

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historic times, Sapoetan and Klabat, while eight others are still in the fumarole stage. We were actually in a veritable nest of volcanos, such as perhaps exists in no other spot on earth. But it should not be imagined that the peaks of these volcanos are visible much of the time, for clouds cover them almost continually.

The agent of the Standard Oil Company in Manado advised us that on the slope of Sapoetan, there was a small rest-house belonging to the new Tuberculosis Hospital at Noongan, and he arranged for us to stay there. The hospital itself was modern, and beautifully run by Dr. Tilaar and his nurses, all of them Celebians.

One of my great desires in coming to Celebes was to see, in its native haunts, a most beautiful palm which I had first seen in Sumatra in 1926, in the little Botanic Garden of Sibolangit, and had been trying ever since to establish in Florida. It is *Pigafettia elata*, named after Pigafetta, the companion of Magellan and the historian of his trip around the world. I searched through the parks of Manado for it the day we landed, thinking it must certainly be planted there, but found only Cuban royals; nobody seemed to know what I was talking about. I thought they might know it as the Rattan palm, which it is sometimes called, but that name was new to them too. Perhaps it might be the "Wanga," some one suggested; that was a very tall palm that occurred along the road we were to take. We were all eager to be the first to see one, and at every turn of the winding road we searched the roadside. At last Marian exclaimed, "There it is, there's your *Pigafettia*." Fully eighty feet high it stood, and straight as an arrow, even more beautiful than my memory of it. The tree was twenty years old, according to the villagers near by. It was the only one in sight, but we knew there would be more of them farther on.

The character of the people of Minahasa began to appear as we passed through the tidy little villages. A pretty thatched house with its owner weeding her rose bushes out in front of it; *Spathodea* trees in full bloom; a durian, its spiny fruits outlined against the sky; roses and hibiscus and bougainvilleas and citrus and dooryard gar-



Eighty feet tall and perfectly straight, this *Pigafettia* palm, the first I ever saw in the wild, towered above all other trees on the hillside. It sometimes grows to 120 feet.



Right: This pretty, thatched cottage, whose owner was in her rose garden, charmed us as we drove by into the Minahasa highlands. *Left:* These Minahasa boys carried water from the spring in lengths of bamboo. I wondered if they found them easier than buckets would be.

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dens bright with flowers—all had been touched with the western ideology; transformed, perhaps some would say. It was hard to think that the ancestors of these polite and gracious people had been head-hunters. But the ancestors of all the races of man seem to have done all sorts of things their descendants disapprove of.

The rain stopped after we reached the guest-house, and in the lovely light of the setting sun Mrs. Archbold, Marian, and I walked up the mountain road to the top of the divide and found there two clumps of *Pigafettia* palms, one with its crown so close to the bank that the full beauty of its leaves could be studied easily. Long slender spines of golden brown covered the bases of the leaves. The sunlight gilded them and made them very beautiful indeed, set off as they were against the dark green trunks marked with grey rings where the leaves had fallen off. From that moment I became unreasonable in my admiration for this tree, and I have remained so to this day.

Hugo and Ned set off up the slopes of Sapoetan with cameras, hoping to get photographs in color of its brilliant green trunks. Quite unexpectedly they discovered three other very handsome palms; one an *Areca* with lacquer-red sheaths, reminding me of the famous "lacquer palm," *Cyrtostachys lakka*, rare even in botanic gardens. This is a larger palm with stilt roots and large fruits an inch long, a beautiful red in color like the stem on which they are borne. Ned's color photograph of this striking palm, taken in the dense forest on the mountainside, has never failed to bring him applause. From last accounts, seedlings of this beautiful palm were growing in the Mt. Makiling Arboretum, in Mr. Langlois's palm collection in Nassau, and here in southern Florida.

There was a sulphur mine far up the slope of Sapoetan and we got permission to go up the forest road leading to it; a beautiful drive, though most of it was made while it was raining. Although I will admit that there is a strange fascination in watching steam and sulphur fumes pouring out of a deep pit where human beings are digging yellow masses of sulphur, it is a sight which does not really inspire me. Growing within reach of the fumes, however, on the

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rocks above the mine, Mrs. Archbold discovered a little bushy honeysuckle with beautiful white flowers that possessed the most delightful fragrance. It is too bad that the seeds I sent over never grew.

The managers of the mine invited us to have a cup of coffee in their comfortable bungalow, where to our surprise on the mantelpiece stood all sorts of indications of Nazi affiliations. Only three months later the German army invaded Holland. And now the Japanese doubtless control the mine.

Back in Manado, we called, as a matter of course, at the "Klapper Proef Station" (Coconut Experiment Station), introduced ourselves to the Director, Mr. Tammes, and visited his laboratory and field station, planned on much the same lines as American stations. Covering the ground between the palms was a tangle of what I am sure is the most viciously spiny legume in the world, *Mimosa invisa*. In 1926 I had sent seeds of it to Florida, and two years later, when it threatened to spread too fast, I became alarmed, poured gasoline over it, and burned it up. "It is one of our best cover crops for coconuts," Tammes remarked when I told him my story, "but you must know how to mat it down." He called a workman and with a horizontal pole with two handles the fellow, though barefooted, smashed the tangled mass of stems down on the ground and walked calmly over them. What is dangerous under some agricultural circumstances may not be so under others.

Mr. Tammes and his charming wife lived in a spotless modern bungalow near the shore, part of a subdivision built by a well-to-do Chinese. Insofar as modern conveniences go it was completely equipped. Mr. Tammes was a trained laboratory botanist stationed in Celebes to study the diseases of the food plants of Minahasa. He was a good example of the many Dutch officials scattered over the vast archipelago whose efforts were accumulating valuable stores of information. Without this information, improvements in the practice of the agriculturists would be impossible.

The tiny island of Lembeh, near which the Junk was anchored,

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looked like good collecting ground for plants that would stand salt spray; so we invited Mr. Tammes and the Forester, Mr. van der Vlees, to join us on a trip just before we left. In the small launch we could get close under the overhanging vines and trees which covered the little rocky islands and gather seeds and flowers from just the kinds of plants which ought to do well on the Florida coast.

Nothing contrived by man that I have seen, compares in beauty with the landscape effects which nature had created on one matchless rocky islet around which we cruised. Superb cycads, *Cycas circinalis*, drooped from the crevices in the rocks, their crowns almost sweeping the salt water; a tangle of lianas, so dense that it was almost impossible to get through it to scramble up the cliffs, festooned the irregular walls above us. As the launch drifted under an overhanging rock, a scraggly bush almost swept my face and I reached for the little red berries on it. They reminded me of the fruits of the orange jasmine, *Murraya exotica*, which four times a year fills The Kampong with its delightful fragrance. But they looked different, and I am glad to say that my friend Swingle, the citrus expert, who two years later examined the bush growing on The Kampong, pronounced it a new species, or perhaps a form of *Murraya paniculata*. I have not seen its flowers yet.

I kept snatching at every kind of seed or fruit within reach from the launch, but discovered that it was not altogether a safe thing to do when I came within an inch of getting a snake. His stripes caught my eye just in time, and I photographed him sleeping quietly on a branch.

Hugo, who had gone off after more palms, returned from his trip up the slopes of Mt. Klabat, drenched to the skin as usual but carrying, among other things, two beautiful palms, one a solitary feather palm that fruits when only eight feet tall and bears showy orange berries; and the other a species with striking orange leaf-sheaths and lacquer-red fruits. They were both *Areca*s. Only the dwarf one has survived. Hugo was quite wild over a marvellous weeping ficus tree with leathery leaves and brilliant red fruits he

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found in the forest, and although he had never been in Florida, his imagination painted streets lined with it. The seeds grew amazingly, and I have just now retrieved a copper tag which had been buried by the rapidly growing bark of my specimen, already eight feet high and only two and a half years old.

While we had been collecting in Minahasa the crew on the *Chêng Ho* had been engaged in substituting light bamboo battens in the sails for the heavy wooden ones originally installed in Hong Kong, which, when the sails came down, made a terrible racket and shook the Junk. There was of course something always going on in the way of readjustments of the running-gear on the ship—enough in fact to fill a separate book with details.

XIV

Fable of a Tree-Climbing Crab

THE Resident and the scientific men I had met helped to fill my notebook with the names of places to go and reliable people to see. They convinced us that the shore of the gulf of Tomini and the West coast of the peninsula were full of prospects, for they included one of the driest regions in the whole archipelago, where they believed the date palm might be cultivated to advantage. Only thirteen inches of rain fall there during the year; and plants adapted to Florida should be found. Incidentally, there was the chance that we might see, perhaps, the strange Maleo birds, which lay their eggs in holes in the sand, to be hatched by the heat of the sun—fascinatingly described by Wallace and others.

It was the 20th of February when we left the anchorage in the Straits of Lembeh and sailed along the East coast of Celebes to Gorontalo, where we tied up in a sheltered harbor between hills that were in striking contrast with the densely forested, volcanic slopes we had just left. For this South shore of the peninsula is dry, and we were there in the dry season. As I looked out of the porthole above my bunk the next morning and watched the goats following single-file the paths they had made along the hillside, and saw the curious desertique vegetation, dominated by a tall, picturesque species of *Dracæna*, I was reminded of the goat-infested landscapes of the Balearics. It was a delightful change.

We had scarcely set foot on land when the excitement began, for baskets of Maleo eggs were for sale and we were informed that

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they were excellent eating. They were larger than turkey eggs and almost perfectly elliptical. I found them very good, but it seemed a shame to eat them, for they probably came from a Maleo reserve that the Government had established up the coast.

Waiting for us on the pier, so to say, was one of the giant coconut-eating crabs. Dating from the time of Darwin's *Voyage of the Beagle*, returning travellers have told the story that this huge crab, *Birgus latro*, climbs up a coconut palm at night and cuts off the nuts, which fall to the ground; whereupon the crab descends, tears off the husks, breaks open the nuts, and eats the white meat.

A story current in Tomini Bay was that the natives caught the crabs by building platforms of coconut leaves around the palms, eight feet or so above the ground, through which the crabs climbed up at night. Crawling back down after cutting off some coconuts, when they touched the platform of leaves they thought they had reached solid ground and let go their hold. Being very heavy, they fell through the leaves and their shells broke on hitting the ground below.

These crabs were about the fiercest-looking creatures one could meet on any strand, and when ours was brought aboard on a leash everybody was afraid of it. Getting it to back up into a big glass jar, where we pickled it in formaldehyde, furnished lively entertainment for the crew, and during the performance one clip of its immense pincers dented the steel blade of a kitchen knife, and another cut a hardwood mop handle in two.

A year later, when the pickled crab arrived in Coconut Grove, we opened the box with much ceremony in front of some scientific friends, whom we had assembled to see it and hear the story of its unique feeding habits. What had happened, chemically, to that crab we never did find out, but the stench was awful. The taxidermist in Miami, who later tried to mount it, discovered that it simply would not dry out, and even after another year's time it was still not free from odor.

Fable of a Tree-Climbing Crab

Retreating to my Florida study from the smell of the crab, I picked up from my desk the latest number of the delightful illustrated magazine, published in Java during the past thirty years by the Natural History Society of Netherlands India, called "De Tropische Natuur." To my amazement, for coincidences interest me, even though I attach no mystical significance to them, the leading article was one which exposed the fallacy of the whole coconut crab story. To add to the coincidence, the article must have been written about the time we were pickling our crab in the harbor of Gorontalo. Its author, Dr. A. Reyne, in this September 1940 number had assembled the literature on the subject and found that no reputable observer had actually seen a crab open a coconut. All attempts to induce it to open coconuts in captivity had failed. It lives, like other crabs, on a variety of plant fragments, not refusing decaying animal substances.

The pretty little town of Gorontalo, with its shops and clean streets, made a most agreeable impression as we wandered through it. In one of the shops I met a man who talked of his place in the country and of his kapok plantation, and when he learned who we were, he invited Hugo to go out there with him and collect palms in the virgin forests that surrounded it. Later we all visited his plantation and saw thousands of kapok trees, covered with pods.

To get the little black seeds out of the silky "down," an initial threshing was done in an area about as large as a basketball field, completely surrounded and covered with chicken wire, and having a cement floor. About a dozen children, each holding a forked stick, stood in a line before huge mounds of the fluffy, white kapok fibers. At a given signal they started in, laughing and shouting, to toss all this down into the air with their sticks. As it settled slowly over them they looked like children out playing in the snow.

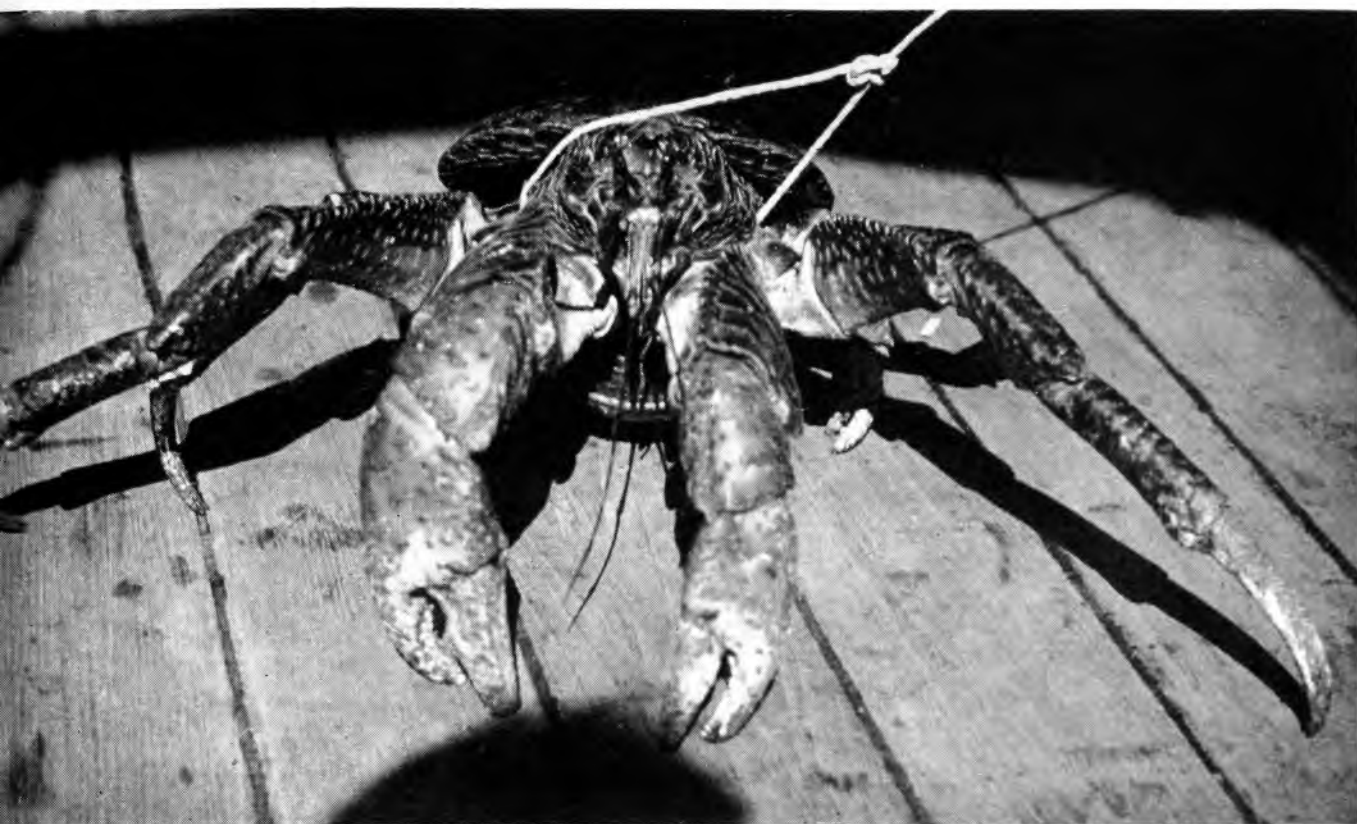
According to Burkill, the kapok tree is a native of Asia, although all its relatives of the genus *Ceiba* are American. *Ceiba pentandra* he would retain for the name of the Asiatic species, and our so-called

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"silk cotton" tree, so common in the West Indies, he would call *Ceiba occidentale*.

Just because the hairs of the kapok are hollow and have walls that do not absorb water, they hold air, trapped both in the spaces between them and inside the hairs as well. It is this character that makes the fluff valuable. Although cushions have undoubtedly been made from them probably for centuries, it was not until the last war that their value for lifebelts and rafts came to be recognized. There has been much talk of encouraging kapok culture in the United States and the West Indies, but, although the trees grow rapidly and to immense size, when I looked at them in Mr. Kulche's plantation and saw how the pods were distributed, often fifty feet above the ground, I wondered what the boys would have to be paid to climb the trees every few days and gather the widely scattered pods. As in many plant industries, the cost of assembling the product might eat up the profits in countries of high labor prices. My old friend Dr. L. F. Dewey has discovered a form of *Ceiba acuminata* in Mexico with hairs that are even more difficult to wet. It deserves to be given more attention.

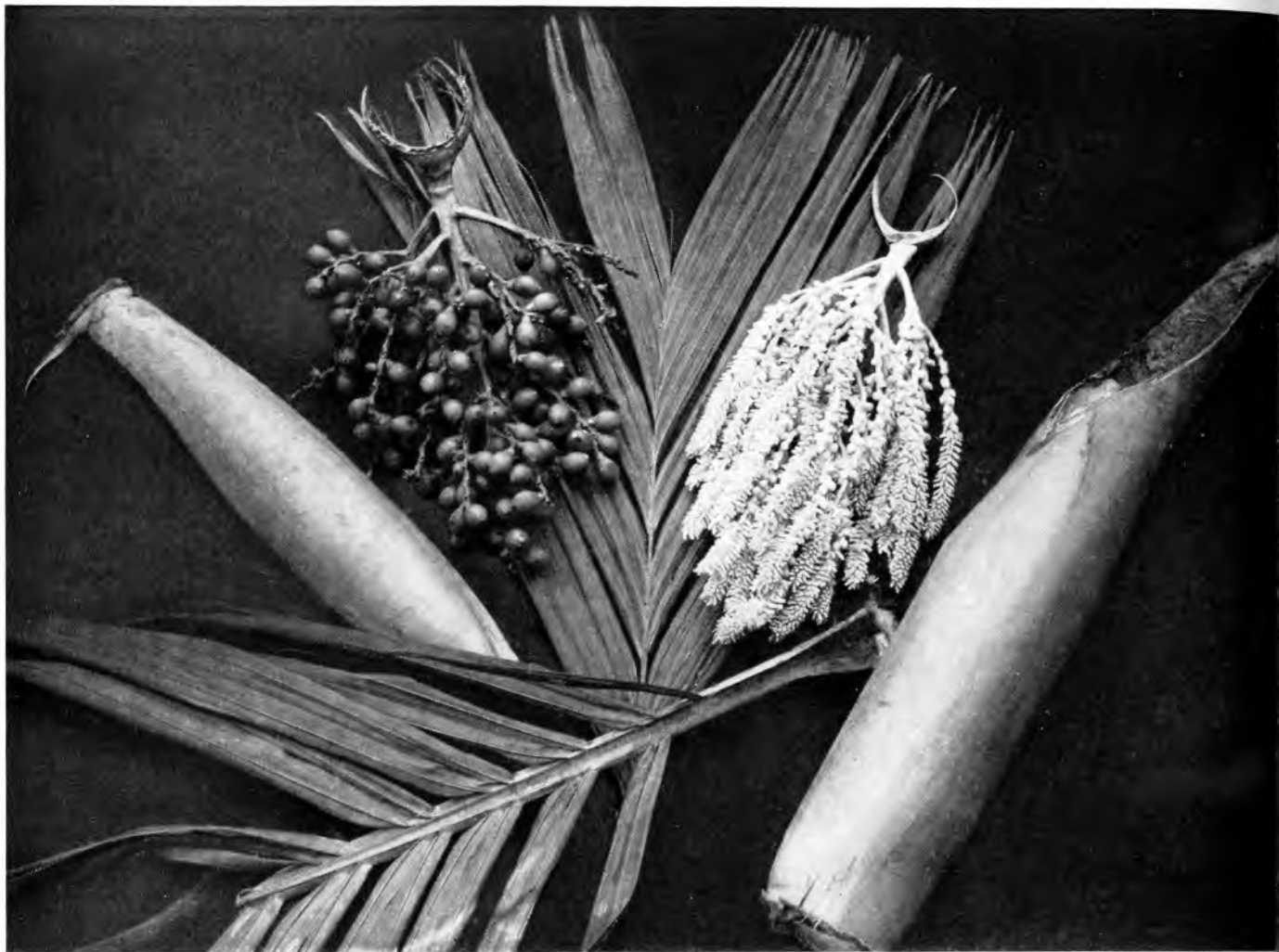
We had driven out to Kulche's plantation, and had a picnic luncheon on the banks of the Bone River. It was a beautiful day, and along the roadside in the shade it was as cool as a midsummer day in Maryland, or perhaps even cooler. It was only when I left the road and followed a footpath off into the hills that I appreciated how different everything was. I had managed to make my way through some tangles of bamboo when I found the path blocked by an immense stemless palm whose leaves were twenty-five feet long, with petioles as large as my wrist. I could not hack my way through it. To get around it meant a scramble either up or down a steep slope of loose dry clay. It was a stunning palm, an *Arenga* of some kind, and as it had fruit clusters rising from the ground that were two feet high and bore fruits the size of plums, I spent an hour of good hard work wresting them from their fruit stalks, which were almost as tough as steel. The hard leaf petioles turned the edge of my machete



The giant coconut crab on the defensive.



With such spines as these, tough as steel, the long leaves of the Rattan palm hold themselves in place in the tops of the forest trees.



To identify a palm, the botanist must have dried fragments of the leaf tip, a section of the leaf and its base, the leaf sheath, the flower spathe, the flower cluster, and a cluster of the fruit.
(Expedition No. 219)



Left: In order to collect its velvety black seeds, Hugo had to cut down this beautiful 50-foot Pinanga palm on Mount Sapoetan. *Right:* Inconceivably spiny are the leaf bases which protect the single tender bud of the Sago palm.



It would tax anybody's ingenuity to make a botanical specimen of this gigantic *Oncosperma* palm which Hugo brought in from the forest back of Gorontalo, Celebes.



Right: Each of these holes in the sand was dug by several Maleo birds, who took turns laying their eggs in it. There were scores of these craters in the maleo preserve (page 116). *Left:* My attention was divided between the Maleo birds and thickets of this beautiful, fragrant orchid, *Vanda celebica*.

Fable of a Tree-Climbing Crab

and I had a time getting through the tangle they made to where the fruits were. It was a tussle such as I once had in a similar situation in Sumatra among some rattans. As I now look at the sturdy seedlings which grew from these seeds in our slat-house, I feel proud of that hour's struggle to get them.

While we were looking for a place to lunch, a small forest tree had stared us in the face. It stood on the bank of the river which the road followed. Imagine masses of bitter-sweet with much larger fruits than those we have at home, forty or more of them in a cluster, scattered all over the tree! These fruits were a beautiful orange outside and sealing wax red inside, and the seeds were mahogany brown. The fruits were ripe that February day and I thought of my friends looking at the trees years hence when they came into fruit at home. It has been distributed to the Garden members as a species of *Harpullia*.

On the grass along the bank were lying a dozen or so immense, winged seeds, which I recognized as belonging to a giant creeper I had once seen in Java, *Zanonia macrocarpa*. Far off against the sky line, on a tree which would have had to be felled to get them, were three of the strange, gourd-like fruits, a foot or more through, from which these beautiful seeds on the grass had escaped in a shower, together with scores of others. Being supplied with wings as perfect as those of any glider, those in my hand had sailed for a quarter of a mile across the river. I recalled how interested Mr. Graham Bell had been in some I gave him, and how attentively he had studied their shape and watched their flight, back in those days when most people "knew positively" that man could never fly. A bomber roars over my study as I am writing these words.

Calamity Sunday Aboard the Junk

WITH all sorts of advice as to where to stop in the Gulf of Tomini, we left our sheltered harbor in Gorontalo about four in the morning, and sailed along the beautiful coast of the peninsula to Marisa. It was a glorious day, but the high mountaintops were for the most part covered with clouds. There were beautiful stretches of mangrove forests and nipa palms, the best we had seen.

But for the first time in the cruise we ran aground, on a sand bank. The old chart showed twenty-three meters, but the sea bottom, like everything else in nature, changes. By lowering the big launch into the water the Junk was lightened and got off easily.

When we anchored off the little fishing village of Marisa, a big canoe filled with men came off to see us. They were delighted with a "klin" can that had been thrown overboard, and when Kilkenny towed them ashore with the launch, probably never having travelled so fast before in their lives they shouted with excitement. We felt that we were really among natives who had seen little of Europeans, for they flocked to the shore in their meagre costumes as we shot by them in the launch. We were intent on exploring a river, marked on the chart but without a name.

A nameless river on the coast of Celebes! That river trip stands out as one of the most interesting of the cruise, and as a sample of what we might have expected to find along this little explored coast of Celebes. Plume birds, curlews, herons, and a few pigeons rose as we rounded the bends of the stream, but in no such numbers as I

Calamity Sunday Aboard the Junk

have seen them over the Everglades of Florida. In fact, one of the real disappointments of the whole cruise was the paucity of birds we were able to see anywhere. An occasional hawk, a few herons, gulls of course, white cockatoos now and then, were about all. I did see one amazingly beautiful sight however: a flock of green parrots feeding on the great pink flowers of a Malay-apple tree, *Eugenia malaccensis*. The brilliant green birds moving noisily from branch to branch sent down showers of the deep pink stamens so that the ground was completely covered with them. Their raucous squawking was the only jarring note.

The tide was so low that we ran aground and I wandered over the mud flats that stretched away from the river and saw enough of them to realize there would be plenty of new things to find here. Hanging over the swift flowing stream I recall a magnificent specimen of the *Barringtonia racemosa*. It had great flower clusters two feet long, but alas, no fruit, or I should perhaps have been able to boast of having added it to the character trees of our Biscayne Bay mangrove vegetation. No strand tree excels in beauty its relative, *Barringtonia speciosa*, whose strange square fruits have drifted across the oceans all the way from Mozambique, East Africa, to the Pacific Islands and established themselves on the beaches. I have a tree of this species, with its immense leaves, on *The Kampong*, but it is very tender.

There was one bird in particular which we were determined to see. It was the Maleo bird, which I mentioned in the preceding chapter, or "Maleoloophoen," as the Dutch call it. In fact, one of the reasons for coming to Tomini Bay was to see it. Here we were at Marisa, close to the "Panoea Natuurmonument" for its preservation, which had been established in 1937 by the Netherlands' India Society for Nature Protection. A National Monument, in the American sense.

We had picked up a fellow of Marisa who could pilot us to the spot where these strange birds were to be found. I am afraid Ned and I felt a bit too confident that if we could see them we could

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photograph them. Neither of us had stalked wild game, as Mrs. Archbold had done in East Africa, years ago, and in her opinion we bungled the job badly.

We landed on a beautiful beach. Looking across a stretch of short grass, we could see sand being thrown out of the deep holes the birds were making in the light sandy soil in which they lay their eggs. We were as quiet as we knew how to be, but that was not quiet enough. They took to flight instantly and, although we saw them at a distance perched in trees, they never came down again. Others we were able to surprise near other holes, but the microscopic specks they made on our films indicate that we were pretty far away from them.

Of course it was a disappointment not to be able to study the maleos, for they are among the most peculiar birds in the world. Think of birds that are communal, several of them digging their nest together; birds that are so constructed that they can produce only one egg a week, but that one so large you wonder how so small a bird can lay so enormous an egg; birds that never sit on their eggs but, like turtles, leave them to be hatched by the heat of the sun.

My mind insisted on wondering how the little maleos got out of those deep craters of sand, once they had hatched. I asked the native, an intelligent man who had eaten many maleo eggs and often had been here where they nest. "They climb up out of the holes and, like little turtles, make a straight course for the water," he declared. On the other hand, Wallace, who studied them carefully, asserts, but not on his own authority, that they can fly as soon as they hatch out.

The naturalist le Souëf relates that the little chicks of the Brush Turkey of Australia, which lays its eggs in mounds of leaves and sticks and is next of kin to these maleo birds, "has to be held firmly to prevent its escaping, when it emerges from its shell." It has wing feathers sufficiently formed to enable it to fly a short distance and to roost in the trees at night.

The situation where these strange birds nest was most interesting,

Calamity Sunday Aboard the Junk

for the sandy soil was a mixture of fine humus and dark volcanic sand, and so light that our feet sank into it, as I recall that they did years ago in the Forest of Marmora in Morocco, where thousands of bulbous plants were growing. My attention was divided between the desire to photograph the maleos and an interest in that soil and the plants growing in it. I found that I was walking carefully around the rims of small craters six or eight feet across and three feet deep, and could not help comparing myself with a little ant making its way around the dust crater of an ant lion. But while the ant, if it slipped, would fall prey to what Wheeler calls a "demon of the dust," the worst that could happen to me would be to break a lot of maleo eggs. There were scores of these craters near together.

With my back turned to the fringing vegetation of these bare, sandy areas where the nest craters were, at first I did not notice that I was brushing against beautiful orchids in full bloom. There were patches of them many yards across which were almost as tall as I was, with stilt roots half buried in the sand and with masses of fragrant flower clusters as large as my hat. It was a *Vanda*, known to botanists as *Vanda celebica*. Alas, my efforts to get small plants of it back did not succeed. It might grow on our sandy lands if we could ever get enough fine humus into them to duplicate the soil there among the maleo nests. What made me think it would succeed was the fact that *Cordia* trees and *Premna* trees, both represented in our dooryards, were everywhere about this raised level land.

Taking a guide with him, Hugo had gone alone into the forest back of Marisa. We gathered at the gangway to greet him when he returned at dusk, and heard his report of an exciting day, which included meeting and almost stepping on a large python which the man with him insisted on killing. Hugo laid on the rail the immense head of the python. Fenton was all for cleaning it and keeping its skull as a souvenir, and he took it below. But Kilkenny noticed that the Chinese did not seem to like the idea of Hugo's having killed a python, and were carrying on much conversation about it. Had we

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known as much about the superstitions regarding the Goddess Tien Fei—whose statue held a place of honor in the dining room of the Junk and who was the protecting “Saint” of the cruise—as we did about those of the albatross, we would have done otherwise with that python’s head. For this snake is an animal sacred to Tien Fei, and to kill one is grossly to offend her. Even the flag of the Junk had a python on it.

I am sure that what happened the next day proved to the minds of the ten Chinese that Tien Fei could mete out swift vengeance.

At the grave risk of raising the question in the minds of my readers as to why Marian should not have written this book, I am going to copy here her account of what came to be known on the Junk as “Calamity Sunday,” an account which she wrote not long after the event.

“March 9th, 1940. Just as we were so happily starting in on the real ‘exploring’ part of our trip, Fate laid out a detaining hand—and now we are proceeding full speed for Soerabaya, the most up-to-date and Europeanized of all the cities of Netherlands India. But it has good doctors, we hope—engine doctors, electric switchboard doctors, and a doctor to look at David’s leg.

“‘Calamity Sunday’ as Anne Archbold dubbed it, was on February 25th, just a few hours’ run from Marisa. Ned, Anne, and Fenton had gone off at dawn hoping for a chance to make good pictures of the maleo birds which we had all seen the day before; so we didn’t start until about nine. All was peaceful activity aboard the Junk. Ned had gone below for a snooze after his early start, but David and Hugo were in the laboratory. I was cleaning some shells for Bill Clench; Anne had Mo So, the engineer, helping her to change the water in some flower vases and to take the palm from the sitting room out into the sun; while on the poop deck Fenton was cleaning the skull of the twenty-foot python Hugo had brought home the night before.

“Ah Fook was in the big launch, cleaning her up after the morn-

Calamity Sunday Aboard the Junk

ing's work, when suddenly we heard him give a shrill cry, which was taken up by another of the men. Mo So and Kilkenny rushed below as we all saw and smelled the thick brown smoke that was pouring out of the engine room funnel just forward of the laboratory.

"In an instant all was in confusion, the curious high-pitched voices of the Chinese making it all extraordinarily exciting. Several jumped to the launches to lower them. The engines stopped. Kil came up unruffled but serious. 'Yes, it's a fire.' Captain Fant called: 'Close all the ventilators! Stop the draught!' The gang ladder was lowered and men started a bucket brigade; ventilators were closed, dumping the fruits, specimens, baskets, mattresses, cushions, etc., that were on them pell mell on the deck. Kil smashed the top of the fire extinguisher and poured the contents down a ventilator into the engine room, and poured down the buckets of water handed to him. Every one was working furiously.

"I wondered what I should take if we had to leave the ship, but even as I wondered I saw the hatchway doors closed and then wisps of smoke seeping through the cracks.

"Daan said, 'How about having Ah Fook tow us to the shore?' And the order was given; then some of our gasoline tins were lowered from their outside shelf into the small launch.

"There seemed nothing we older ones could do except keep out of the way of the bucket brigade.

"Captain Fant came to me and said in his soft voice with the good North of England burr: 'Please get into the launch, Mrs. Fairchild, you and the Doctor and Mrs. Archbold, for there may be an explosion any moment.' I told the others, also Ned, who pulled the small launch up to the gangway for us, and we got in. Anne picked up her shore bag and I my jacket. Fant handed his log and the range-finder, and began to pitch in pillows. Ned went back for his camera bag at Anne's insistence, for it had not been taken below after the maleo expedition. Some one threw in his high wading boots—evidently just anything in sight was to be salvaged.

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“ ‘Stuff those pillows into the open port-holes as you go by,’ yelled Fant, which we did, smelling smoke as we did so. ‘Here—put this on the Doctor’s head—he hasn’t got his hat,’ and there was Captain Fant lowering his own straw hat to us by a rope as we passed around the stern. ‘Hurry to the big launch,’ called out Kilkenny. ‘Ah Fook hasn’t weight enough to tow us.’ We all piled in from one launch to the other, transferring gasoline tins, boots, logs and range-finder in short order, leaving Ah Gunn to return in the small launch to the Junk.

“Then our motor missed fire and we drifted towards the Junk, tangling the rope in the propeller. Over went Ah Fook, diving and untwisting and coming up for breath, then down again, while every second seemed an hour with the shore so far away. At last it was clear, he swung himself on board, and we got under way—pulling the Chêng Ho along well.

“We looked at each other and laughed. Here we were headed for an uninhabited shore—all of us barefooted, though Ned had boots along. David in pajama trousers and kimono. Gas enough to make the nearest town.

“ ‘And to think that fifteen minutes ago our chief worry was what we were going to have for lunch,’ said Anne.

“When I next looked at the Chêng Ho, her sails were up and she was going almost as fast as we were; then Kil sang out, ‘All right, it’s out,’ and we let go and came alongside. ‘Don’t come aboard yet till we make sure and till we get some of this gas out,’ he said.

“We saw him and Mo So tie cloths over their mouths and noses and disappear below, to return very soon and stagger coughing to the rail.

“Pretty soon we were able to get back—and such a mess and such a smell!

“Anne started right in to pick things up and I was shamed into trying to do so too, but the smell was too much for me, and soon she gave it up.

“The fire, they found, was started by a short circuit in the

Calamity Sunday Aboard the Junk

switchboard. When Kil and Mo So got below, the engine room was afire, and as they stopped the engines one of the automatic fire extinguishers went off and the gas was so bad they fled without having time to close the door.

"The fire started at 10:40, according to our meticulous Ned, and we were back on board at twelve; but how fourteen men could have done all those fourteen did I can't see. Closed everything, lowered launches, collected fire extinguishers, had a bucket brigade, got the pump out and working, knocked a hole through the engine-room wall below the laboratory, moving a dozen jars, and plant presses, and suitcases, and cans, to get down to it, got sails up—well they certainly worked fast, furiously and efficiently.

"I had a moment's question about the Chinese on account of their shrill cries, but it only lasted a moment.

"When it was all over and the air was beginning to clear we had lunch on deck and pretty soon they were able to go below and take stock of the damage. The engines were intact, though there was only one starter for the two—we must go to Soerabaya for repairs.

"What should we do? Go too or stay in Celebes and be picked up?

"I went below and noticed the trap door in our cabin was open. As I left again, I pulled the stool over between it and the door, as I knew David would fall in it if he could. I wondered if that would be enough, but I didn't go up and tell him, I went back to what I had been doing in the laboratory.

"'Marian, come here, David wants you,' called Anne as I came to the stairs. 'He has fallen and hurt his leg.' Yes, he'd just moved the stool and fallen into the hatch and there he was, a gaping wound on his leg and blood everywhere.

"'I can get on deck,' he said. 'I can't see anything down here.' We got out all the first-aid things and David directed the job. He and we decided not to sew it, as it was directly on the shinbone and as we did not know if the periosteum was injured, for the wound was two inches long, and deep, and had begun to swell badly as we

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worked. A bed was made for him in the deck house, and early the next morning Daan and I returned to Marisa to telephone a doctor in Gorontalo. No telephone, no radio, no road; so it was decided that we must return to Gorontalo, which we did, arriving that night. David was fairly comfortable and we had no light and he was tired and sleepy; so Daan and I went to town and arranged for the doctor to come the next morning.

“To make a long story short, we spent a week in Gorontalo with the doctor coming aboard every morning. Then we left Ned and Hugo, and here we are, halfway to Soerabaya.”

I am aware, as I read it, that Marian's account reflects little credit on me further than that by implication I showed no particular signs of cowardice or great excitement. The grim moment, as I recall the episode, was when we were towing the Junk towards the mangrove swamp with the prospect of camping out there with nothing much to camp with. Nobody was frightened. It was a beautiful day. How could the Junk burn to the water's edge and destroy every vestige of clothing except what we had on? Even Tien Fei's anger would not go so far as that.

The crew performed purification rites, killing a chicken and sprinkling the blood about the ship. Then they cooked it and laid it on Tien Fei's shrine—after which they feasted on it themselves.

XVI

The Coconut Pearl

THE enforced stay in Gorontalo gave us the chance to plan a separate collecting trip through Celebes for Ned and Hugo. That arid region around Paloe Bay must be visited and the Toradja Highlands explored. So the party was split. Ned and Hugo would have to take to native steamers, giving them a brand new experience.

It was irksome to lie disabled on the sofa and watch the dry landscape shift as the boat swung back and forth, but I have learned that it is not always in the lap of the one who rushes around that the plums fall. So, while the doctor came and dressed my leg, other and charming residents came too, and from them we learned more about the life of the Hollanders in the outlying posts of their great "Tropisch Nederland," as they call it, than we did at any other point in our cruise.

Mrs. Archbold and Marian made friends on land; they found how well the schools were run, and discovered that the children had organized a bamboo orchestra. The instruments were mostly flutes made from single bamboo stems by the boys themselves. The low notes were produced by small bamboos held inside the larger ones. Long ago I had come to love the notes made by the blind flute-player of Batoe Toelis in Buitenzorg, and I was charmed with these bamboo flutes whenever I heard them throughout the archipelago. From the small, shrill-noted fifes of the Atchinese to these low deep-noted flutes of the Minahasa people, there is quite a tonal range. Their plaintiveness suits the music to moonlight nights under the

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palms; as we discovered one evening in Florida at "Panther Hammock," the place of our friends the Deans. John Bitter, conductor of the symphony orchestra here, laid down his golden flute and took up one of these boy-made bamboo instruments we had brought home. Of course I liked the bamboo music better.

It was really an exciting morning when Kilkenny, who was always making friends on shore, placed in my hand a large pearl and said, "It's a coconut pearl, Doctor. It comes from inside a coconut." I had never even heard of such a thing until a few days before, when Captain Diedrich, with whom Daan and I had been lunching on his little K.P.M. steamer, had spoken of them. Now I could scarcely believe my eyes.

Kilkenny's friend, Mr. Wong, who was one of the principal coconut buyers of Celebes, called later and told me that in the fifteen years he had lived there he had been able to get only four or five pearls like the one he gave Kilkenny, although all the growers from whom he bought his dried coconut meat, the "copra" of commerce, knew that he would pay a good price for them.

The pearl turned out to be of extraordinary interest. My friend O. F. Cook dug up an article about it that had been buried in the literature—mention of its existence not seeming to have gotten into the books on the coconut—and this substantiated the accounts of its rarity. I abstracted from this story of Dr. Hunger and his hunt for the coco pearl the fact that it is a growth in the interior of the coconut, apparently induced by an abnormality of the nut itself, whereby no hole or pore in the shell is formed; usually there are three of these pores, although only one is open. There being no hole, the embryo inside of the nut cannot push its leaves out into the sunlight, a diseased condition results, and sometimes a pearl is produced. It is composed of carbonate of calcium, like the pearl of the oyster. These abnormal nuts occur very rarely, so rarely in fact that poreless coconuts bring high prices in the Orient and are found only in the collections of the wealthy Radjas and merchants. Indeed, it is said that formerly all "blind" or poreless coconuts belonged to

The Coconut Pearl

the Radja and were not the property of those who found them. The coco pearls are even greater curiosities. Their beauty alone entitles them to the high place they hold as jewels.

When we discovered how rare it was, we locked it up, and now we bring it out only for exhibition on state occasions. The last ones being when an armed policeman guarded it, at the "Tropical Ramble" held by the Montgomerys as a benefit, and again at a show at the Four Arts Exhibition in Palm Beach.

Thus, while it irked me to be out of the collecting business, the stay at Gorontalo brought its compensations. We were never uncomfortably warm, for the temperatures ran from 71° F. in the morning to 90° at noon, with wet bulb temperatures of 69 and 77 respectively—and this when we were only 26 miles North of the Equator.

On March 5, in the afternoon, we were under way for a seven days' run of 1,067 miles South along the coast of Celebes, and across to Soerabaya in Java. If anything should happen to the one good starter and the diesels should stop, we would have the sails, although they would be a slow means of propulsion. Fortunately all went well and we made the run in 160 running hours; 6.8 m.p.h. nautical.

XVII

Down the Coast of Celebes

AS I lay there with my leg up, I was thankful I had brought with me the new and wonderful atlas of the Tropical Netherlands. Its name in Dutch is formidable. I give it as an interesting example of the language of the Netherlands, but let me contend that as Dutch is almost completely phonetic and its words are compounded, it is not the difficult language that a first glance at the lengthy words would seem to indicate. It is not nearly as complicated as German. There is something to be said for a language in which you can make new words just by adding syllables to old ones. The chemists have to resort to this method in naming their thousands of new synthetic compounds. This "*Atlas van Tropisch Nederland*" is gotten out by the *Koninklijk Nederlandsch Aardrijkskundig Genootschap in Samenwerking met den Topografischen Dienst in Nederlandsch-Indië*, published in Batavia, Java, in 1938 and for sale by Nijhoff in The Hague. To its making some of the foremost scientific men of Holland have contributed, and it contains a great deal of information not found in most atlases.

With one eye on the port-hole to be sure no volcanic peak escaped me, I became conscious that we were in a place of seas as well as volcanos; that on the double-page map of the Archipelago before me the word "zee" (sea) appeared twenty-one times, each time with a name like Java, or Flores, or Bali, before it, and at that, the map did not include the Coral Sea off Australia. I had visited thirty islands in the West Indies, but they are all grouped around

Down the Coast of Celebes

the one sea, the Caribbean. This Malay Archipelago is indeed a most surprising part of the world. Just how many islands there are—how many thousands, I should say—I do not seem to be able to find out; no one knows. They stretch East and West for nearly 3,000 miles along the equator and lie scattered North and South of it for 900 miles, between the tenth degree of South latitude and fifth degree of North latitude. Forty years ago so little was known about this vast and wonderful region that the Century Atlas devoted as much space to the Counties of Southern England as to it, and no wonder either, for in those times it was a long way off and had not then been half explored.

Since that time what changes have come! To recount them all would require a book, but as we sailed South along Celebes I jotted down just a few of the great things that have happened out here within my memory.

Krakatoa blew up and scattered her ashes into the upper stratosphere, and they reddened the sunsets of the world for over a year. The *Pithecanthropus erectus*, the first ape-man, was discovered by Dubois. The rubber tree from Brazil, *Hevea braziliensis*, came into cultivation and became the source of the rubber tires of the world. The Cinchona tree of the Andes was introduced and grew into an industry which has yielded the thousands of tons of quinine that have saved the lives of millions stricken with malaria. The native carvings and Batik fabrics of the Javanese and the Balinese have filled the houses of Americans with beauty, and provided themes for countless travelogues and mural decorations. The development of the petroleum industry, with its hundreds of thousands of workers, and the many metal industries as well, have contributed to the vast wealth of the world.

For the plant lover the Malay Archipelago has always been a kind of mysterious fairyland. Among its treasures are a plant without leaves, *Rafflesia*, but with flowers three feet across, which grows as a parasite on the roots of a liana and smells to heaven when it opens its gigantic petals; there is the Durian, which drives people

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crazy to get its fruits or else drives them away disgusted by its odor; there are insects so like the leaves or flowers on which they sit that the eye fails to detect them; there are white ants which cultivate mushrooms in their underground nests; there are many plant species whose leaves have pores (hydatodes) in them to let the excess water out when the air is saturated. This is the land of the famous Mangosteen, of the Ramboetan, the Doekoe, and a host of other delicious fruits which my friend Ochse has most beautifully described in his *Fruit and Fruit Culture in the Dutch East Indies* and which Javanese artists have illustrated for him. In his maps in the atlas, Dr. van Steenis has outlined plant areas and plant formations, naming them after plant genera which it will puzzle the northern botanists to identify, for they will all be strange to them.

But this amazing archipelago is not only the home of a wonderful flora and fauna. It is the home of over sixty-four million people, nearly forty-two millions of whom inhabit the islands of Java and Madoera. These two islands together are only a fourth larger than Cuba, but they support over ten times the population, and this population is said to be increasing at the rate of half a million babies a year. According to Wallace, there were only three and a half millions in 1800.

With all this increase in population no great cities have grown up, such as have arisen in Australia, the Argentine, or even Cuba, with their very much smaller populations. In Java, with its 42 millions, there are only six towns with more than 100,000 population; the largest, Batavia, having only half a million. One might say the Javanese do not go in for cities. They love the land.

This seems evident when we compare Java with commonwealths which were wildernesses two hundred years ago. Ohio, with four-fifths the area and but one-sixth the population, has nine cities of over 100,000. Argentina, with twenty times the area and only one-fourth the population, has one city of more than 2,000,000 people. Even Australia, which is sixty times as large as Java but has only one-sixth its population, has a city of 2,000,000 inhabitants. About one-



The Coco pearl is so rare that you may open 750,000 nuts without finding one. This rare jewel is pictured about as it would be found in the white meat of a coconut near the end where the sprout comes out through the "pore."

When a coconut germinates there forms inside its shell a spongy, white mass of tissue—a kind of sucking organ that dissolves the coconut meat and turns it into liquid food for the young plant, to nourish it until it can take care of itself.





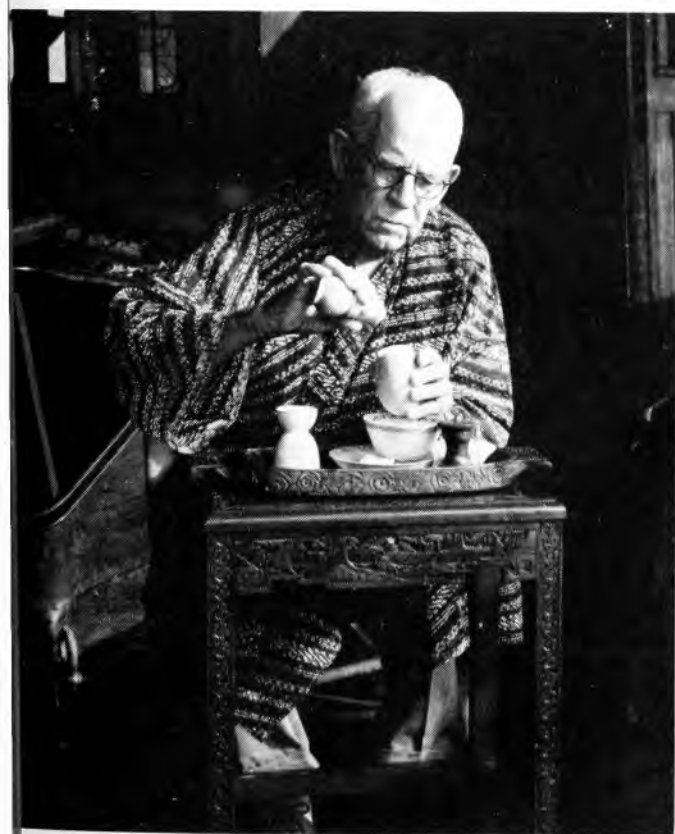
Ned Beckwith and the ponies on which he and Hugo went into the interior of North Celebes while the Junk was in Java, in April, 1940.



128B Some of the boy flute-players of Gorontalo, with the bamboo flutes which they made themselves.



Nothing about this photograph would indicate the predicament in which Marian, Anne, and I had just found ourselves—towing the burning Junk toward a mangrove swamp, on “Calamity Sunday.”



Right: The fire-fighters of “Calamity Sunday,” with the fire safely out—Fenton (left), Kilkenny, Daan, and Fant. *Left:* I have eaten the eggs of turkeys, ducks, geese, ostriches, pigeons, terns, turtles, fish, and spiders, but this Maleo egg I consider the finest flavored of all—and who can contradict me?



Right: Daan's excitement at seeing once more the volcanos of the Lesser Soenda Islands was so great that he climbed into the launch to watch the sunset behind Rindjani. *Left:* Until one has lived where the coconut palm grows, he can scarcely realize the beauty of its white kernel when peeled and offered for sale in a bazaar, as here in Bangkalan, Madoera.

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sixth of all the inhabitants of Cuba live in Havana. If the Javanese had crowded into Batavia as the Cubans have into Havana, it would be a city of seven millions, approaching the size of London.

What do these comparisons mean? Are they phenomena of agglutination, such as one sees among the bacteria, or of a herding instinct, as among the hoofed animals; or are they the result of inventions that have lured those helpless to withstand them, away from the land?

What language do these sixty-odd millions of people speak? Two hundred different languages and dialects, some of which are very difficult to learn. Forty millions, perhaps, speak Javanese; and there are few Europeans who have taken the pains to master it, although a good many speak it a little. Malay is the most widely known language, and is so simple that any one can acquire a smattering of it in a few weeks if he lives among those who speak it. Its many vowel sounds make it melodious, and to me it has always seemed to have a slightly plaintive character. The Dutch have their way of spelling it, and the British, of course, have theirs.

We went without stopping to the East of the islands of Banggai, avoiding the swift currents of Greyhound Strait, which, with our maimed power plant, easily could have given us trouble. Though the *Chêng Ho* with all sails set made good speed before the wind, against it she was a clumsy affair. Since the charts were not too good, and shoals and little islands were abundant, Kilkenny and Fant must have been relieved when we got through the Banggai group—islands, by the way, where the people number only a few thousand, yet have, I am told, a distinct language.

We anchored off Raha in the Straits of Boetoeng where, as in the Straits of Lembah, Japanese power-boats were at work; only here they were fishing for pearls. Next day we were at Boetoeng, a tidy little village of the Dutch colonial type. The Straits were surpassingly beautiful and would no doubt yield interesting plants, as I could see with my glasses from the deck.

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This was a fascinating run down the coast of Celebes, and I quote again from Marian's diary:

"The fire had put our entire electrical equipment out of order, so we stopped each night where there was a chance to pick up some ice and perhaps a few fresh provisions. A coop was built out over one side of the bow where we kept live ducks and chickens, and a big bin on deck held vegetables. We kept a trolling line going, and once in a while it hooked a fish and then there was great excitement—all the dark faces, and all the light ones too, lining the rail to see our dinner come aboard. I must say, however, that during the whole cruise disappointingly few fish were caught. A day on the Shark River in South Florida has brought more than the boys got on the whole trip.

"One great pleasure of being on so small a boat as the *Chêng Ho* was that we were so close to the water. The curious open bow was only about ten feet above the surface, and was a fine place to watch the porpoises playing; they were so close that Captain Fant tried to harpoon one with a gaff on the end of a bamboo pole; needless to say without success. Often there was brilliant phosphorescence at night, and it was thrilling to stand on the little platform of the gangway with the stars above and the tiny, flashing animals of the sea below. Every night we would watch the Southern Cross, first lying along the horizon and then gradually straightening as the night wore on. Orion we could always see, and the Dipper; but the Dipper was always upside down, spilling all the water back into the ocean."

As we approached the straits of Salajar and entered the Flores Sea I had on my lap Wallace's *Malay Archipelago*. He passed through this same strait in 1856 going to the Moluccas. He was in a 70-ton native sailboat or 'prau', with 50 natives on board, and making before the wind nearly five knots an hour. He wrote: "There was no quarreling among these 50 men of several tribes and tongues aboard; wild, half savage looking fellows, and few of them feeling any of the restraints of morality or education. We get on wonderfully well.

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There is no fighting, no quarreling, as there would certainly be among the same number of Europeans with as little restraint on their actions, and there is scarcely any of that noise and excitement which might be expected."

Wallace lived in the Malay Archipelago eight years and made seventy collecting journeys in it and came into close relations with its many races. He was one of the most acute observers of nature that the world has known, comparable in this with Charles Darwin, and they both arrived at the same generalization regarding natural selection, at almost the same time. As the evening light poured through the port-hole on to his book, I turned to the last page and read, as I have so often done, his farewell message—the lesson which his observation of uncivilized man had taught him.

"We should now clearly recognize the fact," he wrote, "that the wealth and knowledge and culture of *the few* do not constitute civilization, and do not of themselves advance us towards the 'perfect social state.' Our vast manufacturing system, our gigantic commerce, our crowded towns and cities, support and continually renew a mass of human misery and crime *absolutely* greater than has ever existed before. They create and maintain in life-long labor an ever increasing army, whose lot is the more hard to bear by contrast with the pleasures, the comforts, and the luxury which they see everywhere around them but which they can never hope to enjoy; and who in this respect, are worse off than the savage in the midst of his tribe."

Were it active now, I wonder if that master mind could see clearly the drift of what he called "civilization"? Perhaps it will take a mind even greater than was his or Darwin's to discover what is the matter.

We crossed the Flores Sea to a beautiful bay on the West end of Soembawa, which is one of the Lesser Soenda Islands, where the influence of those drying winds that blow up from the deserts of Australia in the Southeast Monsoon is clearly evident.

We had been passing mountain peaks ranging in height from

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1800 to 5000 feet all the way down from Gorontalo, for this is the most volcanoed region in the whole world, having 125 that have been active since the year 1600. The gigantic Goenoeng Bonthain had loomed up over 9000 feet high off our starboard bow in South Celebes, and on March 10 the Junk dropped anchor in a tiny, sheltered anchorage called Nanga Mira, at the foot of Tambora, which is also over 9000 feet high.

That evening, as we were coming into the anchorage, we saw our first and only waterspout. It must have been six miles away, but so clear that I tried to photograph its outlines. With our glasses we could see objects whirling around in the column of water that stretched like a gigantic funnel from the turbulent sea below to the inky black clouds above. And as we watched it, like an elephant's trunk the funnel drew up and disappeared and the clouds flattened out again.

I was reminded of George Kennan's thrilling description of how he stood and saw the column of steam rise from Mt. Pelée, ten thousand, perhaps twenty thousand feet into the air, and was so enthralled with the sight, he was not aware of the danger he was in. A volcano in eruption is one of the sights I have always hoped to witness, but although I have travelled much in volcanic regions, for some reason I have never experienced even the slightest tremor of the earth. My mother once had her china broken by an earthquake in Kansas while I was in the island of Java!

The 11th of March off Soembawa will remain always in my memory as one of the perfect days of my life, so perfect that I took the pains to write an account of it in my little notebook. It may be that in the course of the years some one reading this will be impelled to visit Soembawa. I hope so. And I hope he will explore its peculiar vegetation, which has, I think, many plants that would grow in Florida. Here is the account:

"Yesterday morning we were anchored at the base of Mount Tambora on Soembawa. Anne and Marian went off and got a mess of fish from the fishermen on the shore near Pulu Satonda. After

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they had returned we entered back of Mojo island the Strait of Batahai, into the marvellous Saleh Bay, across whose West end we skirted. This island is covered with very interesting looking, spiny vegetation and I want to return here and explore this bay which I have been seeing through my glasses for hours, unable to go ashore.

“Until midday we were in sight of Tambora, which once blew up (in 1815) and killed 12,000 people; darkened the sky for 300 miles around and left the island covered with ashes.

“Scarcely had the slopes of Tambora faded in the haze behind us than the gigantic cone of Rindjani, 12,051 feet high, rose through the clouds over the island of Lombok. As we neared it, the sun began to sink behind it and the peak was outlined sharply against one of the most wonderful sunset skies I ever beheld. Rindjani is the highest of all the volcanos in the archipelago except Kinabalu, in British Borneo, and certain volcanos in New Guinea. It is higher than any of the nine great volcanos of Java, which range from seven to eleven thousand feet, and it deserves to be mentioned in the same breath with the even higher peaks of the western hemisphere, even though it is not snow-capped—Chimborazo 20 thousand, Popocatepetl 17 thousand, Tolima 18 thousand, and the snow-capped mountain of Africa, Kilima Njaro, 19 thousand—because, unlike all these, it rises straight up from the sea (its crater lake is only ten miles or so from the shore), whereas most inland peaks one can only see from altitudes which often dwarf their heights.

“I sat on the deck wrapped in a blanket, for it got cool. Marian sat beside me and we gazed and gazed into that scene of sky and earth and almost glassy sea (for the waves had calmed down) until it seemed as if we were a part of its glorious beauty.

“The show gradually faded out, clouds gathered over the peak of Rindjani and the mystery was gone. The lanterns and candles on board were lighted and then we began reading about Germany and talking of war and politics and squabbling over who had put a lantern where it might have burnt up the boat, and Anne and Marian played a game of Chinese chess or checkers, and Daan told me of his recent

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experiences in Germany until I dropped off to sleep in the lounge in Anne's deck room aft . . . The sailors shifted the sails and we rode along so quietly that the slight discomfort Marian and I had felt when we pitched a bit after leaving Soembawa entirely disappeared, and I slept soundly until the first break of dawn. Looking out of my port-hole I saw the sharp outline of Goenoeng Agoeng, 10,000 feet and at the other end of the saddle, Goenoeng Abang, 7,000 feet. I watched the daylight come over these peaks, and as the sun rose, the two volcanos of yesterday, the ones we had passed, stood out against the morning sky. As daylight came the scene became more and more beautiful, and I hobbled out on deck and woke Anne and Marian, and for two hours we watched the morning light as it cast its shadows across the mountain slopes and the glassy waters of the coast of Bali, on which fishermen were already sailing and paddling and paying out their lines. Behind the coconuts that lined the coast lay large areas of a palm that looked strange to me; possibly the Lontar palm, *Borassus sundaica*, the close relative of which I had seen in large numbers when I was in the Gambia with Allison Armour in 1927.

"And all of these sensations had come within twenty-fours hours. I could not help contrasting these hours of supreme and unalloyed delight with other thousands of twenty-four hour periods of my life and wondering why I waste so much of my remaining years over trivialities and utterly uninteresting things about me. Ah well. I have seen these magnificent volcanos, all in one full day and isn't that enough for any one?"

We dropped anchor on March 12 in the beautiful bay of St. Nicholas on the island of Bali. Kilkenny and Daan had been there often, and now they landed at once to see a coconut plantation they had their eyes on, and which they meant some day to buy. I managed to get into the launch and, with Mrs. Archbold and Marian and Fenton, got as far as the shore, where I could see with my glasses what looked like a Buri palm, *Corypha elata*, in fruit. Since there was

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some question of the identity of this species with the Buri palm of the Philippines, I wanted to collect its seeds. I am glad to report that six fine plants are growing in the garden here in Florida as a result of this little excursion.

I was forced to stay in the launch while Fenton felled the tree and the others went off collecting. As I waited for them to come back, strains of music floated to my ears from a native boat with thatched roof—a trading prau which was at the same time a home. I drew up near it and found that I was able to make the Madoerese owner understand my Malay. He showed me his musical instrument, of which he was evidently very proud, and played for me a number of those plaintive melodies which have now come to be recognized as Madoerese. When since Naples days in the nineties had I heard music made by boatmen in a boat? The impression was unforgettable, for as a general rule the natives of this vast region are a silent lot. One does not expect to hear them singing or whistling on the streets or in their boats. The fisher folk of Madoera differ from the others in this respect.

By this time Mrs. Archbold and Marian had commenced to gather shells on the beaches, an occupation which grew more and more absorbing as we got out among islands whose shells had rarely, if ever, been collected for the conchologists. Cleaning shells and cleaning seeds supplemented each other well, and many thousands of these rare shells, objects of superb beauty, are now spread out on white trays in the Museum of Comparative Zoology in Harvard. We hope that William Clench will find that they add to his knowledge of the distribution of these wonderful creatures on the land and in the seas of the globe.

We had planned to visit Bali from Java later; so we hoisted the sails, and with a following breeze sailed the last leg of our long run from Gorontalo, arriving off the Soerabaya lightship before dawn. But we couldn't get through the official red-tape before afternoon. All day long we stewed in the blithering heat and glare of a glassy sea.

XVIII

Java, and the Junk in Drydock

IT WAS in Soerabaya, in 1926, that Marian and I had sold our car with its emblem of a crouching tiger, badge of the Deli Touring Club, in which we had travelled through Sumatra and Java. Bitterly disappointed that we could not get even to Bali, much less to the Moluccas, where we had hoped to go on the *Utowana*, we had taken a steamer for Batavia and, picking up our son Graham in the Treub Laboratory, had retraced our steps to Europe, laden with seeds. This we described in *Exploring for Plants*.

Soerabaya, a little town in 1899 when Mr. Lathrop and I sailed out of it on the *Japara*, had become a city in 1926, with attractive bungalows and land prices as high as those around Washington; but now, in 1940, it was the second largest city in Netherlands India, with a third of a million inhabitants, of whom twenty-six thousand were "Europeans" and thirty-nine thousand Chinese.

I had been laid up in the Oranji Hotel in 1926, and the location of my room was somehow stamped upon my memory; but I had not expected to find myself limping into the identical room in 1940. Even the "boy" who sat on his haunches before the door might have been the same one who cleaned the "Keppel" seeds for me then; but he did not recognize me, though he knew how to clean seeds just as well and was just as polite and good-tempered.

The hotel had been remodeled and made much larger, and the shade trees had been taken away; I missed the friendliness of the smaller hotel. But I like the cosmopolitan aspect of all these tropical

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hotels in Java. I like their one-story architecture and the open sitting room of every suite, affording a kind of privacy in which one sits in a long chair to receive one's guests. I like the tanks of cool water in their bathrooms, to be dipped out and poured over oneself—the so-called “splash baths.” Electric fans in the bedrooms were a new addition and made life far pleasanter. But I was disappointed that the rijsttafel was no longer part of the daily menu. All sorts of European cooking had made the hotel table like all others; it was not distinctive any more.

The poor little Junk had to be hauled up into the shipyard among big steel ships, and when we went to see her the noise of the riveters recalled to my mind other days in Göteborg, Sweden, when Allison Armour took me to see the *Utowana* being built out of a freighter. “Frightful” is the only word that is adequate to describe the noise.

Taking stock of the situation, we realized that the *Chéng Ho* would be a month in the hands of the repair men; so I decided that there were two islands I would visit: the dry island of Madoera, just across the narrow strait, and Bali, which of course we all wanted to see.

Daan and Kilkenny, who had lived in Bali, brought to the hotel Miss Vannin Manx, the owner of a tiny hotel, Kampong Tantri, at Koeta Beach on the South coast of Bali. She had motored over with her native chauffeur, Poegeg, and was glad to take us back with her.

Before going to Bali, however, I induced her to take me with her across to the little island of Madoera, for I had begun to get around again. Madoera is a low, flat island and is reputed to raise the best beef cattle and to have the largest salt pans in the Archipelago, the pans from which comes much of the salt consumed in Java. There are about two million people, though the island is not half the size of Puerto Rico.

The short day's ride along the North coast of Madoera made me wish I had a month to study its characteristic industries. Almost the first new fruits I saw were in a basket on a woman's head. They were the size of a small peach, covered with shiny brown scales that fitted

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tightly over each other like the scales of a fish. She set them down on a pile of wood for me to photograph, but since she spoke only Madoerese and understood no Malay, she hurried on with them before I could get much information from her. They were the fruits of the Salak palm, *Zalacca edulis*, and we were in the midst of plantations of them, a half acre or so in extent, on land that was low and moist and calcareous, like some of the soils of our Florida coastal plain. I bought a few, peeled their scaly shells off, and found them sweet and good, but not what one might call exciting. The Javanese Mohammedans prepare them with salt water and syrup and are fond enough of them to take them on their pilgrimages to Mecca. It is a pleasure to find that some of the seeds we got from the frightened woman along the road have grown and seem to be thriving today.

The village of Bangkalan is noted in the Archipelago as a center for the culture of this palm. Going to see their nuts for sale on its market, we found other things as well. One old man of the market played a joke on the American. Finding that I would taste almost anything, he offered a ball of curious-looking material and motioned me to eat it, but the bystanders began to laugh so uproariously that I suspected something was wrong. It was a kind of soap.

It was in this interesting market that for the first time in my life I saw coconuts served as they ought to be: shelled and peeled as one would peel an apple, the thin brown skin being removed from the "meat" with a sharp knife. Some of the beautiful white balls were laid out on fresh banana leaves in front of the pretty Madoerese girl, around whose head honey-bees were swarming. Approaching, I saw that the bees were feeding from little jars of "Jaggery" or coconut sugar, for sale beside her. She brushed the bees away when a customer wanted some of her wares.

Here also the fruits of my pet *Antidesma* were for sale, the only time I saw them offered during the cruise. This is the fruit from which Mrs. Letchworth of Miami makes her famous antidesma jelly, one of her best sellers, she says. From the seeds of the fruits I bought at Bangkalan, little seedlings have grown and have been sent

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out to our local amateurs and we shall see how much they differ from the trees already here.

This summer from an old tree beside my study here in The Kampong, Mrs. Letchworth's pickers gathered twenty bushels of fruit, which, translated into juice for jelly-making, meant 72 gallons. No tree could very well be more heavily set with fruits than mine.

Near the fruits of the antidesma was a pile of Malindjo fruits, the importance of which to the Madoerese and Javanese we are not in a position to evaluate until we know how much and what vitamins they contain. The fruits, their seeds, the curious flower stems, and the leaves of this tree, *Gnetum gnemon*, all form a part of the native diet.

I was further impressed with this fruit when one morning in the Botanic Gardens in Buitenzorg, on chatting with some little boys who were taking their breakfast in a lookout there, I asked to see what they were having. Each boy had, wrapped in a banana leaf, a little pile of boiled rice, and in the middle of each pile was a small piece of the male flower stem of this malindjo; these were like the pile of little stems I had seen for sale in the Bangkalan market. It had a pleasant flavor, but I wondered whether it hadn't a deeper significance, supplying perhaps some element which the rice lacked. I came to like very much the "kroopook malindjo," made by flattening out the boiled seeds into hard little cakes. They had a slightly bitter taste. Does it contain vitamin A or B₁ or C—or what?

Just to illustrate what surprising analogies a microscopic study of plants will sometime disclose: it has been found that this Malindjo, (a species of *Gnetum*) is remotely related, in a botanical sense, to the *Ephedra* and to the *Welwitschia*, two extraordinary genera of plants. The Malindjo is a small tree with glossy evergreen leaves. The *Ephedras* are almost leafless shrubs, from which comes ephedrin, a drug whose use many asthmatics and persons subject to colds know. The *Welwitschia*, which inhabits only the deserts of South West Africa, where specimens a hundred years old have been found, consists of a short, corky, bowl-like stem, sitting on the hot sand,

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with the only two leaves it ever produces stretching out in opposite directions like immense thick, green ribbons, to a length of twelve feet. It is, in fact, one of the most remarkable creations of the whole vegetable kingdom. And the Ephederas, the Welwitchia, and the Gnetums are all only one step away, as shown by the structure of their embryos, from the Conifers, in which group are to be found the pines and spruces!

Sunday is like any other day in the Orient; it comes and goes and you don't distinguish it from "week days." One Sunday I spent some hours in the excellent bookstore near the hotel, gathering all the data I could find on the Moluccas and Bali; and when I looked around me I could but compare the array of books I saw with what one might find, for instance, in any bookstore in southern Florida or California.

Where were the hundreds of novels in their paper jackets? On the shelves were books in five languages, on all sorts of subjects: philosophical, mystical, scientific, historical, and geographical. The flood of ephemeral magazines that flows over our newsstands had scarcely reached this end of Java. Could one generalize and say that Hollanders were reading books rather than newspapers and magazines? At any rate, they are polyglot to an amazing degree in comparison with us Americans, who rarely have, lying around our houses, books in any language but English.

We Decline Cremation in Bali

AT last we were off for Bali. Poegeg, a Balinese boy with a charming personality and a keen sense of humor, was at the wheel. Miss Manx, whose long sojourn among the Balinese and whose mastery of their language had given her an understanding of their character, began to tell us stories of these fascinating people.

How easily one forms a prejudice, and how often it is utterly unwarranted! Many of the books about Bali are filled with pictures of women dressed to the waist only, just as the Miami papers are filled with photographs of bathing beauties dressed even more scantily. In consequence I had the feeling that I could get along without seeing Bali. I found that I had judged too hastily, and that what I took as representative of the Balinese was no more so than the bathing beauties of our beaches are representative of our American culture as a whole.

I had, it is true, been once in Bali with Mr. Lathrop, but it was forty years ago, and because there was no understanding between the Netherlands Government and the Balinese we had been allowed to go only a little way from the harbor. The little *Guide to the Dutch East Indies*, published in 1897 by the Steamship Company, which we carried with us then, has no mention of Bali in it, for the island was still closed to travellers.

I find it impossible to generalize about the world of the Balinese; to make comparisons, pass judgments. Its gay, imaginative, but

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deeply "religious" people; its picturesque dances; its amazing pageants; its night concerts given by the light of flickering torches and marked by the cadences of the great gongs and the rhythm of the "gamelan"; its walled-in kampongs with their decorated doorways; its temple services, with streams of women bearing votive offerings; its bamboo poles with their streamers of fresh coconut leaves; its paddy fields covered with water that reflects the sunshine, and dotted with little shrines; its bits of forest; its grey beaches of volcanic sand on which the long rollers come tumbling in; and its three volcanos, six thousand, seven thousand, and nine thousand feet high—these are things that make any adequate description of ten days spent there almost impossible.

As we drove along that first morning the Javanese air was fresh and bracing, as early morning air in the tropics often is. Poegeg, with his turban made up the debonair Balinese way, was gay, for as he told Miss Manx, he was taking the Americans to "his" country. Every expression of delight on our part over the beauties of the Javanese landscape was met, when Miss Manx translated it to him, with the remark: "Wait until they see Bali," or "That's nothing to the beauties I'll show them in Bali." He had reasons for his excitement: he had been frightened by the crowded streets and confusion of the big city of Soerabaya, where he had never been before, and, though he had been away from Bali only a week, he was homesick and wanted to get back. He was also proud of his guests. And when at last we set foot on the island, Poegeg was beside himself. Our delight went right to his heart and he said; "Now that I have them in Bali, I will keep them here always and when they die I will give them a wonderful cremation."

Now a Balinese cremation is a magnificent ceremony, performed on the seashore; it might be compared, perhaps, to those elaborate rites of the ancient Egyptians when they ferried the mummies of their Pharaohs across the water to their last resting-places, and Poegeg was offering us a real honor. But we could not stay, and we

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shall probably be hustled into our graves with little ceremony while the automobiles wait impatiently to take the mourners home.

East Java, through which we motored on the way to Bali, is the dry end of the island, where the mangos grow, and in 1926 Marian and I had motored here to have a look at them, but it was "not the season." Although we failed to get mangos we were given big clumps of the dryland bamboo used everywhere for building houses. The noted botanist, A. C. Backer, whose *Schoolflora voor Java* lies open before me, dug up the clumps for us. Generous fellow that he was, he presented me with his own annotated copy of the Flora.

It is an easy day's run from Soerabaya to Bali unless you have along a botanist who "drags the anchor a bit," as they say I do. We took two days to do it. We spent a stuffy night in Banjoewangi, under those mosquito nets which are everywhere the most annoying feature of Javanese hotels, even though they do protect one from malaria.

To cross over to Bali, the option was offered us of going with our car on a large native sailing craft or waiting for the ferry to Gilimanoeck, and, of course, we chose the more picturesque way.

From the strand of dark, volcanic sand which forms the tip of Bali we looked back at the majestic Idjen mountains we had just skirted. So commonly do volcanos dominate the landscapes here that, although this mountain mass is made up of six volcanic peaks from four thousand to ten thousand feet in height, the names of the peaks seem unknown to the travellers who go back and forth between Java and Bali; and in my atlas, I notice that two volcanos in Java, both over nine thousand feet high, seem to bear the same name, "Merapi." Think of the Canadian Rockies, each with its own particular name you are supposed to memorize!

As I walked along the strand while waiting for the auto to be lifted ashore, the only beach like it I could think of was one in Teneriffe, where Morton Wheeler and I once collected. The dark color of the sand and its fineness gave it a sinister aspect. I learned

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later that in these sands some of the tiniest and rarest of ocean shells had been collected by the Neuhaus brothers, who had developed a special technique for finding them. We later visited their collections.

As Poegeg shot out along the road to Denpasar and home, his relief to have left the horrors of Soerabaya behind was most evident, and it was with reluctance that I decided to stop him in the middle of a natural grove of the Lontar palm into which the road had brought us. When we had skirted the coast of Bali on the Junk, I had studied groves of this palm through my glasses, finding difficulty in deciding that they really were of this famous species, which has played such a part in the lives of the Oriental peoples. Seeing them close by, I was struck with the fullness of their beautiful crowns of leaves, but was disappointed that they were not in bloom. It was years since I had been among the Palmyras, the *Borassus* palms of northern Ceylon and those of the other species in the Gambia, on the African coast, but as I recalled them, and as my photographs seem to indicate, they are both different from this one. I am not surprised that the Italian botanist, Beccari, has given it a different name, *Borassus sundaica*. Since the Palmyra palm of Ceylon and India, *B. flabellifera*, and the Gambian one, *B. ethiopum*, are both growing into large specimens in the Chapman Field Garden in Coconut Grove, I hoped to add this species from Bali; but it was the "off" season and I never got a single fruit.

Before the days of the invention of paper pulp, considered by some critics of our wordy civilization as an invention of rather mixed benefit, the poets and medicine men and priests of the Orient used to scratch letters on the fresh leaves of the Lontar palm with a sharp-pointed stylus. These leaves they then bound together as books. Oh, how these books impressed the unlearned, even as far back as the sixth century! I trust they had more important things in them than the vague generalizations of the old philosophers and the rituals of the priests.

But in addition to books, there are many other things made of this Lontar palm. There are fans and mats and hats and buckets and



Poegeg was proud of his little house in the family kampong, and of his wife and child. He had helped his wife to put her votive offering on her head.



Above: The mossy figures of the jolly drinkers and the fallen leaves of the tall Dipterocarps impressed me more than the troops of monkeys in the sacred grove of the Monkey Temple. The soft rock figures (left) are so covered with moss and lichens that they seem to have grown where they sit.

Below: These black, palm-fiber roofs of the temple of Besuki (right) are said to last for half a century. The quadrangle between the temple buildings, shown at left, was filled with votive offerings of many sorts.



Could you match this scene in any American hotel-yard? Miss Manx's laundress and the little waitress are building a votive offering out of a banana stem and coconut leaves, while more jolly figures in stone look down on them.

When this Balinese boy brought down a leaf as well as a fruit of the "Taop," an *Artocarpus* species, I found the leaf more amazing than the fruit.



Two quite distinct relatives of the Mango are cultivated in Bali. This horticulturist of Pengadji holds the "Kweni" (*Mangifera odorata*) in his right hand and the "Pakel" (*Mangifera foetida*) in his left.



There are hundreds of charming doorways in Bali, each one leading into a kampong, or group of houses. In festival season each doorway is decorated with a "penoyer"—a beautiful banner woven of coconut leaves.



To my disappointment I found no fruits on this handsome Lontar palm of Bali. Its two relatives from Ceylon and the Gambia are growing well in Florida.



Left: Instead of putting flags on flagpoles, the Balinese make "penoyers" with strips from young coconut palm leaves, to dress up tall bamboo poles. *Right:* The graceful beauty of these hand-made banners is appropriate to the quiet roadways of Bali.



It was a surprise to Anne Archbold, as she walked around this *Corypha* palm from Cochin China in the Botanic Garden at Buitenzorg, to discover leaves with stems as large as the top rail of a fence (page 164).



The fawn-like faces of the Balinese cows seem in perfect keeping with the soft "tinkling" of their large wooden cow-bells.



Left: The curious fruits of the Zalacca palm, which taste something like coconut, are commonly sold in the markets of Bali. "Kwenis" fill one of the baskets. *Right:* Here, in pretty, hand-woven baskets in the Denpasar market, was an irresistible array of Mangosteens, "Kwenis" and "Woewoes," and Zalacca palm fruits.

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baskets and fences and thatch for roofs and musical instruments and fibers and timbers, not to mention sugar, wine, and vinegar. Besides all this, the germinated seeds and the large fibrous, juicy fruits are eaten, and the trunks furnish large amounts of starch, though of a poor quality.

It was, however, as a beautiful, ornamental palm for the landscapes of Florida that I coveted it.

We ran into stretches of terraced paddy fields that covered the gentle slopes from the shore to the mountainsides. They had none of the striking grandeur of the rice terraces of Bontoc; they were softer and more pastoral. Here and there were little shrines, tiny thatched houses on stilts, often with evidence that there were offerings inside. Each field had one, and you could not pass them without realizing how deep is the faith in them of the patient humans who, hour after hour, in the blazing sunlight, thrust their arms deep into the mud in which they are standing and fix each rice seedling fast.

Compare such a scene with that of a rice plantation in Sacramento, where the planter sows his seed from an airplane, and you have one of the hundreds of questions of contrast which Bali raises in the mind. If the Balinese have no airplanes, at least they have no machinery to get out of order, and they live in a more tranquil world than does the Sacramento farmer, even though it is not so luxurious.

As we drove through the town of Denpasar we could see that this was a festival season. We passed people making the so-called "penoyers" of various sorts. These were long streamers of young coconut leaves, cut and twisted into all sorts of shapes, hanging from tall bamboo poles. Some were long mats made of strips cut from the yellow, immature coconut leaves, with green ones from the mature leaves, woven into all kinds of designs, hung like banners on the sides of the gateways to the kampongs.

In Bali a kampong is not a village, as in some parts of the Netherlands Indies, but is a family unit. A group of little thatched houses belonging to the individuals of one family are grouped together and

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surrounded by a picturesque stucco wall and entered through a gateway. Many of the gateways had hand-fashioned figures of some grim demon or laughing god. The incredible number of such imaginative and extraordinary statues which one meets with everywhere in Bali, and the countless shrines and temples, must have required the skill of many thousands of artists. I wonder if there are not in Bali more people, young and old who can fashion such imaginative things than are to be met with in any other country in the world?

Poegeg hurried us along and landed us at last at the Kampong Tantri, at Koeta Beach, on the southern coast of the island, where the sound of the long rollers that come tumbling in on the beautiful strand made me think of Honolulu and Waikiki in the nineties. It was a place to rest in—but the trouble was, as it so often is, that there was “so much that just has to be seen.” For it was the time of all sorts of festivals.

Miss Manx's cottage hotel is in a class by itself, as Marian wrote in her diary, “with its little thatched houses, its brick patios, its little household temples and its old Gods. It is done as only an artist in love with Bali could do it. The servants are in gay sarongs, bare above the waist, and include one small boy and two very little girls who wandered in, one at a time, and just stayed. They work or play as they like. Today they all waited on table, in the solemn way of children, and this afternoon the little girls were busy rearranging the temple offerings; one in a purple sarong with orange belt, the other in yellow, and they moved about among the old grey stone statues like gorgeous butterflies.”

We sat out in the garden in which are the little guest houses—these, with the open dining room, comprise Miss Manx's hotel—and watched the servants making a penoyer out of coconut leaves. One of them, not much more than a child, was helping bend and fashion the fresh leaves which a young woman was cutting into strips of special form. When they ran short of materials, Poegeg went to a coconut palm behind the house and pulled out a new, half formed leaf with its leaflets closely packed together, and with as little effort

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as it would require to slice a piece of cheese, the woman cut the edges with her knife and made as many identical pieces as there were leaflets packed together. It was much the same technique we use in cutting out a string of paper dolls. With these she built up as fantastic and beautiful a "piece" as a baker would make for a wedding cake.

At this festive season, every mother was building for her household a votive offering, each of her own design, composing it of the variety of fruits and flowers and ornaments she had at her disposal. A richly decorated wooden stand, such as any Garden Club member of America would covet for her flower show, formed the ground work of her offering. Upon it was built, often to the height of three feet or more, a cone or a pyramid of fruits, flowers, and vegetables, held together with strips of coconut leaves and fastened to a central core made of the stem of a banana plant. Some of them had more kinds than an American vegetable dealer would have on exhibition on his fruit stall. There were bananas, durians, oranges, guanabanas, sugar apples, mangos, mangosteens, watermelons, sandoricums, sweet potatoes, Chinese cabbages, string beans, and other species I did not recognize, as well as sweetmeats made in fancy shapes—and always frangipani and ilang-ilang flowers.

Few women could lift one of these heavy offerings without help, but once the weight was poised on their heads they strode along with that peculiar grace of movement which one sees only among women who have learned to carry burdens in that way.

We went late one afternoon to a temple to watch the women bring in their offerings. It was a striking sight to see them, one after another, come through the gateway into the temple yard where candles were lighted and the priests were waiting to bless their offerings. One woman who had walked several miles with an unusually large offering was leading by the hand a little child, perhaps too small to leave at home. She did not seem tired, and even when the attendants took the offering from her head she merely sat beside it on her heels and gazed quietly at the priest as he sprinkled it with holy water. Then she rose, had some one help her put the offering

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back on her head, and with her little girl clinging to her hand, turned and disappeared through the gateway into the gathering dusk. There appeared to me something of ancient Greece about her naked shoulders and the folds of her brown and yellow sarong, which moved as she walked.

Outside the temple, in the dusty roadway, a crowd had gathered, and the sound of the gamelan announced the arrival of the performers for the so-called Dance of the Kris. Walter Spies, in his remarkable book on the *Dance and Drama in Bali*, has given an analysis of the mythological characters which take part in this and many other dances of these people, who early came under the influence of the Hindu religion. Imaginary characters however have always confused me; they seem vague, and their various names I have hard work memorizing.

There was no stage setting at all; the action took place in the middle of the road and we sat on some benches brought out from the temple for us. It was an extraordinarily impressive hour, there in the evening light. When that incomparable character, Rangda, attired in a great fur coat with bushy tails and an immense, grinning, savage mask with streaming locks, raised her gloved hands in the air and shook them until the three-inch-long fingernails vibrated, with the light from the torches shining through them, I thought the boys and girls would run away, but they didn't.

The most intense moment came when certain actors, who by this time had worked themselves into a religious frenzy, turned their krises on their own bare breasts. The crowd surged up around them, and a priest came forward to see that they did not hurt themselves.

There was something appealingly simple and natural about the way in which these various dances were given night after night. As for the concerts we heard, I am quite unable to describe them to my musical friends, who seem surprised at the spell which the *gamelan* has always cast over us. But let no one belittle the performance of a twenty-four piece orchestra composed of *gambang*s, resembling xylophones of bamboo or metal; *bonang*s, sets of ten or fourteen

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carefully tuned bronze gongs ranging in size from a wagon wheel to a teacup; *gongs*, large bowls of bronze; *ketongs*, little, thin-walled bowls; *rebabs*, two stringed cellos; *soelings*, bamboo flutes; *kendangs* and *bedoegs*, two kinds of drums; and lastly the *tjelempoengs*, a species of guitar. But of all the musical instruments of this part of the world there is none I like better than the *ankloeng*. It is made of hollow bamboo tubes cut to different lengths and set loosely in a frame, so tuned by the length of the tubes that when you shake them they make musical notes. Whenever I want to be reminded of Java or Bali I lift and shake together the two *angkloengs* we brought home with us. In these sad days they send a note of deepest melancholy through The Kampong here.

Walter Spies, whom none has excelled as an interpreter of Balinese music, invited us one evening to hear his gamelan and see the dances which went with it. On a terrace near his house we sat for two hours behind some simple footlights in the grass and watched and listened to the exquisite performance. The music of that evening and the beauty of the bare-footed dancers on the lawn, enhanced by the full moon which rose behind the palms and lit up the fairylike scene, will remain as one of our lasting memories.

There was another evening when we wandered about through one of the temple grounds and watched the priests unwrap some images and wrap them up again, while the great bronze gongs and the gambangs filled the air with their throbbing music. We mingled in the procession, as it left the temple under the overshadowing trees and dispersed.

The "Monkey Dance" had something that the others did not have—a kind of fanatical fervor which reached its peak when a hundred pairs of gaunt hands were stretched eagerly towards the leader who was in the center of a circle of men, all seated on the ground. Just what they wanted or what it all meant I wonder if they knew themselves; but the torches shed a flickering light on their brown bodies as they sat there, and I felt I was in the presence of human longings, emotions of a religious sort. Once on the Tigris, at

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Basrah, I stood in the darkness and peered through the window at a room filled with Shiite pilgrims as they beat their breasts and repeated in chorus their appeals to Allah until they fell exhausted; but those voices were harsh and there was little music in the performance.

To me personally, the concert which struck deepest was one which Mr. Theodore Meyers, a Swiss artist, arranged for us in his courtyard, in the twilight. It is known to him as the "insect concert," although of course it has its Balinese name. As we sat there over a cup of tea, one by one a dozen performers stole quietly in and sat down on the flagging. Each unwrapped a tiny little thing made of the hard outer coating of the mid-rib of a palm. It had a carefully made tongue to which was attached a short bit of twine with a handle tied to it. At a signal these little jewsharp-like instruments were raised to the mouth, and like the whispering voices of night insects, the music began. The performers jerked the little sticks that made the tongues of the instruments vibrate, and the sounding board was the cavity of the mouth. Without notes of any sort, with every appearance of improvising, they played half a dozen "selections," then bowed and disappeared as silently as they had come. If a dozen katydids had come to serenade me in a dream the effect would have been, I imagine, something like what we heard that evening.

Miss Manx's beach faced the West, and sometimes we watched the great red ball of fire go down behind the rollers. Usually it was in the fresh morning sunlight that we took our dip in the Indian Ocean. Then we had our breakfast in the open dining room, and with Poegeg went off up the mountains through the paddy fields, visiting the temples where at this season ceremonials were generally going on. Or we would spend the morning in the various markets, which I found filled with interesting fruits. Of course the ladies shopped some—a good deal, one might say.

In the market at Denpasar we saw baskets filled with a kind of fruit called "Kweni." It is a species of mango, stronger scented,

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and with a penetrating ether-like character that many do not like. The fruits are large and have not the shape of mangos, and their very juicy white flesh drips all over you if you are not careful. Mrs. Archbold was very fond of the kweni, as she was of most of the fruits we found, and I came soon to like them too.

Ochse, in his *Fruit and Fruit Culture in the Dutch East Indies*, gives sixty different native names for it, for it is scattered over the whole Archipelago, but the botanists are content with one, *Mangifera odorata*. When I showed some of the fruits to Mr. Mershon, at whose beautiful house we were being entertained, he offered to guide me on a tour of the gardens where the kweni was grown. He took me to see a man in the village of Pengadji, and I found myself talking to one of those natural-born horticulturists who are scattered over the world without regard to race, who know what they know from actual first-hand experience and who form the background of the art in their particular regions. We went through his neatly kept garden and he pointed out his kweni trees, some of which were fifty feet high. Other trees which looked much like them, and which I identified as *Mangifera foetida*, he called "Pakel" trees, remarking that the Pakel has poisonous sap. Then he gave me a description, much as a Florida citrus grower might, of the different kinds of kweni, their fruiting seasons and keeping qualities, and emphasized the fact that each seed produced only one seedling, had only one embryo—a character that only an expert would think important. Here I was with my hands on two mango species which should be in Florida for the plant breeders to work with, providing they proved to be hardy enough. He offered to climb a kweni tree and get me a branch with fruit on it. The tree was tall; twice as large in diameter and almost as smooth as a telephone pole, and I wondered what orchardist in California or Florida would have offered to climb it.

I was fascinated with the beautifully fashioned little axe which the grower used, and I thought to myself, "I'll see if I can buy it." The pakel fruits were not yet ripe, but in order to help me make a

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photograph which would show the two species, he cut a branch from each tree and held them up, one in each hand. I could have spent much more time in that garden. In fact, the horticulture of Bali deserves a thorough study, as does the horticulture of all the other islands of the so-called Lesser Soenda Group.

As we turned to go, I bargained with the man for his axe, and when I got it, found it so sharp and smooth and beautifully made that I kept running my hands over it. The result was a lovely case of poisoning from the sap of the pakel—it's a poisonous plant, all right. I am not allergic to the ordinary mango, as some people are; so I am bound to conclude that the pakel might not be popular, even if it could be grown in America. As the pakel fruits were not ripe and I dared not send the poisonous budwood, and as the seeds of the kweni that I did secure were held up by the Plant Quarantine Service in Soerabaya, other efforts will have to be made to get the varieties of these two species related to the mango.

I was more fortunate with the "Bandoeng," which is a relative of the mangosteen. It is a handsome tree, and rare even in Bali. Its dull orange, egg-shaped fruits made a great show as they hung in masses among the glossy leaves on the tree beside the road to the Besuki Temple. They are not so good as mangosteens, of course, but I am glad nevertheless that plants of them are growing in our slat-houses here. Botanically, they are still labelled *Garcinia* sp. The "Taop" is another fruit which would interest those living in more tropical regions than Florida, for it is related to the bread-fruit and the jack-fruit and the marang of the Philippines, and might serve as stock for them or might be bred with them. Its fruit has long, soft, curved spines and is a bright, light yellow when ripe. Its leaves are enormous, being four feet long, and have the shape of a giant oak-leaf. It is an *Artocarpus*, of which there are sixty or so species scattered through the Indomalayan and Chinese regions, waiting for some plant breeder to tackle their breeding and selection.

One afternoon we drove through the paddy fields where harvesters in their gay clothes were busy, having a happy time at their

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work. They were making their bundles of ripe rice heads, gathered one by one, as carefully and artistically as though they were to be exhibited at a county fair. Harvest fields with the sun shining on them seem to have a sentimental something about them which appeals to the emotions of most of us. "Bringing in the sheaves" was one of Marian's father's favorite hymns, and we sang it at his grave on the mountaintop at Beinn Breagh when the telephones throughout the country stopped as a token of respect. Harvesting machines would reduce the labor of these rice-field workers—but would the leisure they give bring more happiness or more contentment? It is a big question.

Across the paddy fields there appeared above the horizon a gigantic tree that dwarfed everything about it. "Yes," said Miss Manx, "that's the famous Bongkase, fig tree, the largest tree in all Bali. We will swing around to it after seeing the Monkey Temple." The temple was in a remnant of the dipterocarp forest which once covered perhaps much of Bali. It reminded me of the cryptomeria groves of Japan. The temples were old and their thatch was covered with algae, while the grotesque statues of soft volcanic stone were completely covered with lichens, which made them appear to be natural objects of the forest. Two rows of these were laughing, grinning fellows with drinking mugs in their hands, as tight as a lot of drunken sailors. There were plenty of monkeys about, but they seemed to have little of the curiosity of those which Marian, Graham, and I played with once in Algeria at the *Ruisseau des Singes*.

As I feared, when we got to the giant tree the daylight was fading, but there was light enough to see that it is one of the most curious of all the banyan type of ficus tree. For there seemed to be no central trunk at all—only thousands of small, slender trunks criss-crossing each other in so loose a way that I had no difficulty walking through them. The whole tree, is, as it were, on stilts. It is not over sixty feet tall, but its trunks cover over an acre and a quarter of ground. The leaves, borne on slender drooping branches, reminded me of the *Ficus benjamina*, which has now become common in South

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Florida. The guidebook declares it to be the largest ficus tree in the Malay Archipelago, yet its botanical name, so far as I can find out, seems not to have been determined. Although we searched for fruits until dark we were able to find only a few ripe ones, the seeds of which I most carefully cleaned and packed for the airmail. But owing to delays over which I had no control, the seeds arrived dead. It would be worth a trip to Bali to get that tree, but a trip to Bali is worth while anyhow.

I have seen the various races of cattle that are raised in different parts of the world and I know I am about to hurt the feelings of the boys of our Middle West who have taken blue ribbons for their heifers, but I am going to challenge them to show any such beautiful creatures as the cattle of Bali. The delicacy of their features, the lines of their trim bodies, the color of their hair, their slim legs, and their very short tails, make them seem more like fawns than cattle. The way they carry their heads, poised on slender necks, gives them an air of just having ventured out of the forest. They wear bells, but the faint tinkle of them as you see the beautiful creatures in the pastures is misleading, for these bells, though ten times as large as the cow-bells you hear in the Tyrolese alps, make only a low muffled sound, for they are carved out of *wood*, sometimes beautifully carved.

Miss Manx insisted that as this was the semi-annual festival of the Besuki Temple, in which eight Radjas took part, including one whose family she knew very well, it would be a pity to miss the show. And it would have been. For the Besuki is one of the great temples of Bali, picturesquely situated on a mountainside. Its tall, pyramidal black spires, composed, pagoda-like, of ten roofs, one on top of another, each succeeding roof smaller than the one under it, reminded me somewhat of certain temples in Bangkok.

The little village was filled with visitors and the large restaurant was feeding the visiting Radjas as we drove by. We climbed the flight of steps leading up between tall, carved stone gateposts from one terrace to another, and came finally to the place where the offerings were spread out and the dignified priests in their tall gilded

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head-dresses were blessing them. There was a hushed atmosphere everywhere, no sound of loud voices; there were processions of priests and attendants carrying offerings; fires were being lighted that filled the air with incense; bamboo poles with streamers of braided palm leaves hanging from their tips, were waving in the breeze, and men and women dressed in the elaborate costumes of the Balinese nobility were coming and going between the black-roofed temples.

After watching them for a while, I found it a relief to turn from the crowds of people doing things I could not understand, to an examination of the strange temples. Their roofs, as black as soot, were not thatched with palm leaves, but with palm fibers, and were built up to a thickness of half a foot, like the straw-thatched roofs of Scotland. How often must these thatches be remade in such a rainy tropical atmosphere? Only once in every fifty years, the books report, because they are made of the fibers which wrap the bases of the leaves of the *Arenga* sugar palm, and they are reputed to be "almost indestructible." How could it be that any vegetable fibers packed as these are could resist so long the action of the fungi of decay? I put that question to Dr. C. F. Kettering one day when I called his attention to the fibers on a specimen here in The Kampong, and he suggested that they may consist of a cellulose of a different chemical construction from that of ordinary fibers.

Rain drove the crowds scurrying to cover, and we left them huddled together under the eaves of the temples. The weather seems to be no respecter of persons, and the Balinese, unlike the Igorots, who don't seem to care, do not like to be out in the rain.

One afternoon we visited with Walter Spies a little aquarium of tropical fishes which two Austrians, the brothers Neuhaus, had made, largely with their own hands. They specialized in the small, brightly colored fishes of the reefs, and in coral fans of picturesque shapes and colors. Each tank was carefully designed and made a living picture of superb charm; it was the most exquisite little aquarium one could possibly imagine. They had made also a large collection of the shells

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of Bali, which they were trying to sell to European and American museums.

A few days before we were ready to leave, Daan, Kilkenny, Fant, and Fenton drove over and spent a week-end. Fant was saying good-bye to us, for he wanted to go back to his job in Hong Kong. Daan, too, was not continuing with us, but would remain on his sugar estate outside of Soerabaya. We were sorry to have to go on without them. Fant was an experienced seaman operating out of Hong Kong and knew the coast of Borneo well. He was quick-witted and cool-headed in an emergency, as we found out during the fire on the Junk, while Daan's gay good humor and his ability to make himself agreeable to Dutch officials and Malay fishermen alike were qualities we knew we should very much miss.

We were involved in two accidents in Bali which seem to me to illustrate certain traits of the Balinese character. One afternoon we were approaching a narrow bridge when we heard a truck coming towards us. The driver was coming full speed down a hill and on a curve, and while we could hear him, he did not hear us or see us until he reached the bridge. Then he swerved, just missing by two inches the seat where I was sitting, and turned over into the road-ditch. Two men crawled out, dazed but not badly hurt. A small crowd gathered, but there was no excitement; the police took the evidence and I had to make out the affidavits; there was a long procedure, but no trouble with the Balinese.

Another day, on a narrow road through a paddy field, a woman on a bicycle became confused and toppled over onto the fender of our car, cutting her head badly. Marian was out in an instant, and had the woman's head in her lap and was wiping the blood from her face. She was unconscious, and at first we thought she was dead. Miss Manx went off in the car for a doctor. The stream of passers-by stopped and one of the men who had seen the accident volunteered that it was entirely the woman's fault, that she did not know how to ride a bicycle well enough to ride on so narrow a road. When the doctor came he gave her first-aid. We then lifted her into the car and

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Miss Manx took her to the hospital, where she recovered in a few days.

The absence of any excitement or the slightest sign of anger towards us on the part of the Balinese bystanders contrasts strikingly with the attitude Filipinos would have taken, according to what we were told by several residents of the Philippines. One of these, a Filipino official, who had had an automobile accident and had barely escaped with his life from the angry crowd which gathered, advised us: "If you have an accident, don't stop to argue about it but get to the nearest police station as fast as you can, or you will be mobbed." In comparing peoples, even those of the various islands of the Orient, one must bear in mind that their reactions differ as much as do their languages and their looks.

It would be a mistake, however, to conclude that the Balinese are a lethargic people, for they are very high-strung indeed. Poegeg was a good chauffeur, but by the time he got us back to Soerabaya, the traffic and these accidents, the second of them on the day of our departure, so unsettled his nerves that Miss Manx feared for his sanity, and Daan had to take him home with him into the country.

Miss Manx told amusingly of her experience in taking several of her Balinese men to Soerabaya. They were afraid to cross the crowded streets alone, and she had to take them by the hand and lead them across one by one. They liked the Zoo and wanted to go to the movies every night, provided they could always see "Tarzan." But after only three days they all got so homesick that they came to her with tears rolling down their cheeks and pleaded to be taken home.

A special place in the world should somehow be made for the gay, lovable, musical, artistic, imaginative people of this little island. It would be so easy to exploit them and snuff out their charming civilization forever.

Garden of the East from the Air

WE fully expected to return to Java for a longer stay after our coming visit to the Moluccas. However, while we were waiting on the Junk's repairs, there was time for a brief visit to Buitenzorg by air. To fly over an island about the size of Cuba, which has thirty-five volcanos, seventeen of which have been active in historic times, should be exciting enough. But it meant more than this to me. It meant looking down on "the very garden of the East, and perhaps, upon the whole, the richest, the best cultivated, and the best governed tropical island in the world," as Wallace described it eighty years ago.

When Wallace saw Java in 1865 there were only fourteen millions of the species *Homo sapiens* living on it, and he wandered through vast forests where he saw "beautiful and varied and peculiar species of insects, birds and other animals found nowhere else upon the globe." I wonder if he would view with equanimity the increase from fourteen to forty millions of that destructive animal, man, at the expense of other forms of life; even the extinction of creatures quite as beautiful and not so destructive.

As the plane of the K.L.M. cleared the suburbs of Soerabaya and the countryside was spread out below us, it was evident that Java was crowded with little homes. These were clustered together in kampongs, and clumps of tall feathery bamboos marked their whereabouts. I could see the garden patches, the bread-fruit and durian and mango trees near by, and the irrigating canals feeding the "sawas," or rice fields with water from the mountainside. Where

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were the corrugated galvanized-iron roofs that stare up at one from other tropical landscapes? There were none; roofs of bamboo-shingles, thatch, or weathered tile were universal. Little children looked up at us as they played in the neatly swept dooryards. I could see the turtle-doves in their bamboo cages swung from bamboo poles stuck in the ground. I knew the walls of the houses were made by splitting bamboo stems into strips and weaving them together; that the floors were made of the same material; the drinking cups, the buckets, the brooms, the spoons, the forks, and every imaginable utensil in the house likewise, all from plants "grown on the place," and that the boundary lines which divided the various households was some pattern of bamboo fencing.

As we climbed higher and the sawas reflected the light from the clouds, I could see how they descended, in an almost unbroken series of large flat terraces, from well up the hillsides to the seacoast. There, great ponds resembling the sawas took their places, ponds in which vast numbers of fish were raised for food—not so profitably, however, as I learned later. We were travelling over Middle Java, headed for our first stop, Semarang—a hundred miles away, over country so densely populated that from 250 to 500 people were living on each square mile. Yet in this area below us there is not shown on the map a town of more than a few thousand inhabitants. They do not live in towns, these people. The Javanese are skilled agriculturists who prefer the country. But their families come on so fast that the problem of food has become a serious one; one with which the Netherlands Government has long struggled.

I had hoped we would see at least one of the smoking volcanos as we flew past, but although the Merapi was active, fleecy clouds shut it from view. Here and there were forest plantings of teak; tea and cinchona plantations; Hevea rubber patches belonging to the Javanese; and the larger, light green areas of sugar-cane, planted on lands rented by the big companies. If only the plane had been a blimp! I can imagine it would be fascinating to make a careful and leisurely study of Java from the air.

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Bandoeng was once a quiet, little, tree-shaded place where Hollanders tired of the heat of the lowlands went to "cool their noses," as the local saying is. I have in my orchard a fine souvenir of our stay in Bandoeng: a red-fleshed pomelo. When I tease out its wine-red segments to adorn a salad, I think of Bandoeng as it was then. But when we landed on the airfield the noise was so terrific I thought my head would split. For there were ten training planes all tuning up at once. Bandoeng had become the chief center of Army air activity of the whole Netherlands Indies. This was only five weeks before the fatal tenth of May, when the Germans invaded Holland.

To get away from Bandoeng as fast as we could was our one idea; so we hired a car and were soon climbing over the Pontjack Pass, and without even stopping to see my loved Tjibodas, which I heard had changed so that I would not know it, we swung into Buitenzorg in a pouring rain. But it generally rains in the afternoon in Buitenzorg at the beginning of the Southeast Monsoon; so we were not disconcerted.

As we drove into the main street that skirts the Botanic Garden or "Kabon Besar," I looked for the Hotel Bellevue, where we had spent such delightful days watching the sunset over the Salak and the shadows lengthening across the palms along the river—a scene which Mr. Lathrop used to declare was one of the four most beautiful in the whole world. It was gone; turned into a government office-building. One of the back porches still remained, and later we made our way to it to watch a sunset, for no views but those of the busy street were possible from the new Bellevue-Tibbets Hotel. The disappointment of "going back home and finding everything changed" met us in full force, for even the famous Waringian allee of enormous ficus trees which used to stand in the Palace grounds had been cut out.

The peddlers, with their baskets on shoulder-poles, exposed their fascinating wares, and brought their strings of mangosteens and ramboetans and doekoes to our porch sitting-room in the new hotel

he Great Canarium
 llee of the Buitenzorg
 arden, planted by Hass-
 arl about 1837, holds
 s own as one of the
 ost magnificent ave-
 nues in the world.



Left: The "Lady from Philadelphia" could hardly have called a *Corypha* palm like this in Buitenzorg a "feather duster." *Right:* Who would not envy Verschaffelt the immortality of having superb palms like these in the Garden bearing his name?



Left: Beside the lily-pond in the Garden is a Pinanga palm with lacquer-red leaf sheaths as colorful as those of the Sealing-wax palm near by. *Right:* It would need a color photograph to show the special beauty of this Sealing-wax palm, *Cyrtostachys lakka*. Its leaf sheaths are lacquer-red, its flower stems shade into pink, its fruits are black.

Garden of the East from the Air

as they used to do. But the rather bare "Deer Park" around the Palace, with a busy street between, was a poor substitute for the volcano Salak and the Tjisadane river of the old Bellevue.

But the Kabon Besar was there, and Dr. van den Honert called for us and took us to it as the sunlight cast its slanting shafts of light through the great trees. I was glad that this garden, which was established in 1817 by Reinhardt, when Joseph Hooker and Asa Gray were still little boys, had been placed in a slowly growing city. There had been changes enough, of course, in the plantings, but the magnificent avenue of *Canarium* trees, which was planted in 1832 and which I first saw in 1895, is more glorious than ever, and its beauty thrilled me as it has never failed to do. No city streets have been cut through the Botanic Garden, and no skyscrapers have gone up around it to dwarf the stateliness of its beautiful trees, as they have around so many of the old gardens of the world. As Dr. van den Honert showed us a small addition to the garden, I could not resist the wish that somehow, somewhere, someday, a garden large enough to accommodate the spectacular and valuable tropical trees of the world might be established. This one in Buitenzorg has, it is true, over 200 acres, but these acres have been filled for half a century, and it would require a garden ten times the size to accommodate even a fraction of the interesting trees of the whole tropical world. Many such gardens as this, in many places, in different climates, may come some day when man passes from his present infantile state into manhood, and discovers that the forests of the world are going up in flames.

Dr. Bass Becking, the Director, was in Holland, whither he had gone to gather an increased staff of scientific men for the Garden; but Mrs. Bass Becking had recently returned, bringing her children with her, for she felt that Java was a safer place than Holland. She arranged a delightful dinner at her house to which various members of the scientific staff were invited. There was a tenseness about it, however, for the conversation turned often to the war and to the danger that something might happen to the Director. A few weeks

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later came the reality: Dr. Becking was unable to leave Holland because the Germans had invaded it; and later still, the floods of war swept over Buitenzorg itself. I am glad that none of the party had any idea of what was pending. Where are they all now?

The next morning I met the systematic botanists in the Herbarium: Dr. van Sloten and Dr. van Steenis and Dr. Eyma, who showed me specimens of interesting palms and flowering trees and other useful plants which they, or others, had collected in the various islands of the Moluccas, whither we expected to go. As I run through my notebook I find that I set down, "Jansen, Resident in Ambon, interested in science, according to van Steenis." We were to see much of the Jansens, as I shall relate.

While in the palm quarter one morning I met Mr. Dakkus, the only one of the Garden staff whom I had known before, and I was pleased to find he recalled my visit. When we got to his office he remarked:

"There is a man here who has something for you. He wants to see you. I'll 'bell' him." Before I could find out who the man was, Mr. Dakkus came back from the telephone. "Yes, he says he has got it and will bring it to your hotel. Didn't you write out here for some sort of musical instrument or other?"

Then of course I recalled that three years before, when it was proposed to start a Palm Museum in the Fairchild Garden, I had written to Dr. Bass Becking, asking him if there would be any way of getting from the island of Timor a strange musical instrument, made of a leaf of the lontar palm and a joint of bamboo, similar to one which Mr. Lathrop and I had seen in 1899 and had purchased for the Field Museum. It was this request that the "Houtveester," C. de Voogd, had taken the pains to fill. When he brought it, we discovered he had lived on Timor and had many good photographs of the island, which is dry, like North Australia, and has many casuarinas and eucalyptus and lontar palms, and would well repay a visit when we returned from the Moluccas. The palm-leaf guitar is now in the Palm Museum—but I wonder where de Voogd is?

Garden of the East from the Air

This morning, as I was pondering on how I could describe my sensations upon entering for a third time the Palm Collection for which Buitenzorg is famous, my eyes rested upon a charming species which bears the specific name of *Treubiana*. It is dropping its pretty fruit beside my mango tree on The Kampong; *Syagrus treubiana* is its name.

It was Treub who gave me my first glimpse of the world of palms; a world which has fascinated much greater minds than mine, and which would fascinate many more if they were once to turn into its glades and leave the dusty streets of commerce behind them.

I had been a young man of twenty-five when I followed Minheer Treub along the gravelled paths of the old Garden, which then was already nearly eighty years old—and now, in April of 1940, I was walking there alone, forty-six years later and on my seventy-first birthday, and in my consciousness was the marble bust of Treub which I had just passed by in the laboratory that bears his name.

It is of course a very different thing to visit the palms in their own native haunts than to see them in a collection. However, the gracefulness of their forms is the same, the charm of their exquisite details is not changed, and the beauty of their immense flower clusters is perhaps even enhanced, for in the wilds these superb features are often so high above our heads that we cannot see them clearly or scent their fragrance.

To appreciate a palm you must view it as you would a work of art; as if it were a marble statue or a piece of bronze. For unlike a tree with its millions of leaves, a palm has only a few leaves; but these are immense affairs, and the arrangement of them gives character to the "piece." Moreover, palms are almost always green, except when they flower or fruit, and even then they are never covered with bloom as is a cherry tree, but have here and there a brilliant cluster of fruits—scarlet or golden-yellow or sometimes black. Their flowers are mostly white. The grace of their slim, straight trunks of grey or brown, with the leaf scars making ring-like marks around them, like the faint modelling of a statue, comes to have a

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curious charm for those who live among them. But their glory is in their leaves, those structures so different from the leaves of ordinary trees; so different that even the moonlight when it is reflected from them strikes the eye in bands and not in spots of light. Then too, the whispering of the palm leaves is far different from the sighing of the pine needles or the rustling of the oak and maple leaves. There is an especial softness about it.

I felt this difference when I wandered down among the lily ponds, around which and upon whose bordering slopes the great collection of palms in Buitenzorg is planted. The "Lady from Philadelphia," who had a Ben Franklin Oak and to whom palms appeared as "feather dusters," nothing more, would, I am sure, have found her ideas changing had she walked with Mrs. Archbold and me among the palms of Buitenzorg.

For we would have taken her to the Sealing-wax palm, with brilliant lacquer-red leaf-sheaths scattered among the delicate plumes; or we would have made her look to the top of a giant *Corypha*, loaded with masses of white flowers, a half a ton or so, which mark the close of the life of the great giant; for like the Century Plant it flowers and fruits but once—at the end of its existence. The Lady might have recoiled from the group of *Zalacca* palms, completely covered with brown spines several inches long; and if the tip of a Rattan in the quarter where these climbing palms have been confined had touched her dress, even lightly, she might never have extricated herself unaided. She could not fail to fall in love with the immense-leaved *Licuala* from New Guinea, with slender leaf stems ten feet long, ending in fan leaves spread out like a wheel. And she could not fail to wonder at the South American *Scheelea*, with waving fronds that are thirty-five feet long, and drooping bunches of fruit eight feet or more in length. The Lady would have stood in wonder, as Mrs. Archbold did, at a giant from Cochin-China which bore no scientific name, but whose petioles alone were three feet across at their base and thirty feet long, ending in a colossal fan far too large for any giant to use.

Garden of the East from the Air

I knew there had been many changes in this collection; but since it represented a great assembly of species some of which must be nearly a century old, it was in a measure a forecast—on a greater scale, of course—of what might be expected some day in the Montgomery Palmetum of the Fairchild Tropical Garden in Florida. Fully expecting to have a chance to spend some time in the collection in July, I contented myself now with notes on those which seemed the likeliest to be in fruit when we returned. Mr. Dakkus promised me any seeds we wanted. As he most graciously remarked when we discussed the matter: "I shall be glad to fill any of your requests, for we have always considered you as one of us."

A note came from the Palace that Their Excellencies, the Governor General and Mrs. van Stakenborgh Stachouwer, would be pleased to have us lunch with them informally. I do not know what their definition of "informal" was, but it was certainly not the same as ours! We were met by several aides in full uniform; I was taken to be presented to His Excellency, while the ladies were given an audience with Her Excellency. After a few minutes, we were gathered up again and escorted back to the main entrance hall, and there we stood in line with other guests until the Governor General and his lady appeared and led the way to the dining room. After all, we were lunching with the personal representative of Her Majesty the Queen of the Netherlands, the Governor General of the whole Netherlands India, comprising a conglomerate population of over 60,000,000 people who have always been accustomed to associate authority with certain regal formalities.

At the table, however, we had a delightfully friendly time. Madame van Stakenborgh Stachouwer (yes, they say it all each time) was an American, and we found mutual acquaintances. I could not resist making the suggestion that the site of the old Bellevue Hotel should be converted into a park where people could go in the late afternoon to enjoy one of the most superb views in Java.

We had asked about the Moluccas, where we were bound, but only the Governor's Naval Aide had been there. As we left, he

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counselled us to be sure to see Herberger Straat, which had the reputation of being the most beautiful passage in the whole East Indies. We went out of our way to see it later, but, as viewed from the rather low level of the *Chéng Ho's* deck, it did not compare favorably with others we saw.

Old Friendships in Batavia

THE afternoon train brought us into Batavia, to the old Hotel des Indes. It is inevitable that a small hotel which grows into a big one should become less attractive and more formal. Gone were the grand old ficus trees which used to shade the great square between the wings where the simple suites of rooms once were, and the glamour of the place, as I remembered it in the nineties, had departed.

I had bid good-bye to my friend Ochse on the verandah of the Hotel Bellevue in Buitenzorg in 1926, where he came to bring me some beautiful fruits of the "Pandan Wangi" pomelo which I have described elsewhere. Ochse had sent me two of his books, remarkable productions, one of them covering the hundreds of vegetables used by the Javanese, and the other the fruits. Both of these books are the product of the printing establishments of Archipel Drukkeri of Buitenzorg and the firm of G. Kolff and Co., Batavia, and are so outstanding that I give their complete titles here: J. J. Ochse and R. C. Bakhuizen van den Brink, *Vegetables of the Dutch East Indies*, English Edition of *Indische Groenten*, 1931; and J. J. Ochse and R. C. Bakhuizen van den Brink, *Fruits and Fruit-culture in the Dutch East Indies*, English Edition of *Vruchten en Vruchten-teelt in Nederlandsch-Oost-Indie*, 1931.

Both books represent the close cooperation of the various scientific men of the Botanic Garden and of the Department of Agriculture of Buitenzorg, a cooperation to which Dr. Ochse gives full credit. They are superbly illustrated. The artists who made the pen-

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and-ink drawings, M. Soeparno, M. Kardjono, and M. Marjom, have equalled or outdone anything of the kind turned out by American artists, while Atje Soleiman of Buitenzorg (a Sundanese), in his renderings from nature of such tropical fruits as the Mangosteen, the Durian, the Mango, the Avocado and many others, has surpassed in accuracy and delicacy of coloring any representations of tropical fruits I have seen anywhere. Even the noted illustrations of Eichhorn lack something of the genius of Soleiman's plates. These two remarkable books should be in the libraries of America, for they portray three hundred tropical vegetables and over fifty of the finest fruits of the Orient.

It was with misgiving that I learned in Buitenzorg that my friend J. J. Ochse had been promoted, and now held a most important position close to Dr. H. L. van Mook, the Director of "Economische Zaken" (Economic Affairs)—for who can enter the doorway of bureaucratic affairs and not have his hobby of a lifetime taken away from him?

As soon as we reached Batavia I hurried over to his "Kantoor"—a word I like better than our "office"—and after wandering around for some time in the maze of other kantoor and interrupting many clerks, I found his assistant, Mr. de Young, who knew of our long-standing friendship and soon got us together. Ochse was in the laboratory where the economic uses of the various plant products of Java were being investigated—the methods of preserving fruits, and making jams, jellies, wines and other products.

Yes, of course I wanted to go out to the Horticultural Garden at Pasar Mingoe; so the next day several of us drove out through the suburbs to the "Proef Station," a horticultural experiment station, without which it seems extremely difficult to raise the general level of any plant culture in any country. I looked with especial interest at 12,000 seedlings of the Durian, upon which were to be grafted the finer varieties, one of which, the Koenig Tjomas, was said to be especially delicious.

Old Friendships in Batavia

I could not help thinking, as I peered under the palm shade that covered those seedlings, how strange it is that so "ill-smelling a fruit" should have become famous throughout the whole world of the reading public, while the Ramboetan, which has no such odor but is also a perfectly delicious fruit, should be almost unknown.

Who knows what will be the future of the durian? There are durians and durians, and some of them keep longer than the conventional two days before they smell badly. I met a missionary who lives in Dutch Borneo, who had found there three distinct species or varieties, including one with red flesh, and one that none of his friends found to have an objectionable odor. The question will resolve itself into what can be done with the durian to fit it for the air-commerce in tropical fruits that is fast approaching.

What interested me perhaps more than these durian seedlings was a nursery of avocados, for this strictly American fruit had not made its appearance in Java when I first visited the Orient in 1896, any more than it had become a table fruit in Florida and California by that time. Half a century had passed, and whereas this nursery in Pasar Mingoe was one of the largest in Java, there had been developed in America thousands of acres of orchards of avocados, associations of hundreds of avocado growers, and a commerce represented by the shipment of hundreds of carloads of the fruit across the continent.

This comparison is not made in a boasting spirit; it is made to emphasize the vagaries of taste, and the power to overcome food prejudices that lies in advertising. Perhaps the Javanese don't like the avocado as much as they do the durian, but I surmise that there are still many millions of them that have never had a chance to taste it. Besides, there are questions of finding the best places in which to grow the avocado, and of creating varieties suited to them. Furthermore, there are new diseases and pests to contend with. It is this type of important work that the Horticultural Station of Pasar Mingoe, and the other experiment stations of the Archipelago, have been engaged on.

Garden Islands of the Great East

Ochse wanted me to see the Fishery Laboratory in Batavia, which came in his department; there had been American research students working in it, Dr. G. Meyers of Berkeley, California, being there at the time. Two incidents of the visit that seemed of no particular moment in 1940 stand out in the light of subsequent events. On the table in the large working-room lay a beautifully illustrated book on the aquatic plants and animals of Japan. It was published by the Tokyo Fisheries Society of Japan, and I wished it were on the Junk for our use in the Moluccas, for we had been unable to find any book with which to identify the fishes we saw. As we left, Ochse remarked on what an ideal research boat the *Chêng Ho* would be, if left in Batavia for their use in getting around to the various collecting fields of the Archipelago. "Our boats are too small," he said. "Here is one being repaired now." As I peered under it to see the mechanic at work on the propeller he added, "A Japanese, of course. Our own natives are not very mechanical."

During luncheon next day with the Ochses, their daughter gave us an account of her school experiences in Perth, West Australia. It was the first intimation we had of the close relations which have grown up in recent years between Netherlands India and Australia. After all, the coast of Australia is nearer to Java than Panama is to Florida; and the cool mountains of Java are as attractive to those suffering from the desert heat of Australia, as are the cool dry winters of West Australia to those tired out with the moist heat of Java. Mutual understandings and friendships have multiplied here, as they must throughout the world, shrinking as it is with each new development of air transportation.

To make sure that everything had been straightened out regarding Ned's photographing of the Junk in the Straits of Lembeh, I paid my respects to Admiral Helferrich. His aide, Col. van Stavereen, assured me that everything was in order and that the cabled permission to enter the ports of Java, Celebes, Borneo, and the Great East was valid. With the American Consul I had called on Rear Admiral Stove in Soerabaya and had explained the situation to him.

Old Friendships in Batavia

He advised us that when we returned in July the weather conditions along the Lesser Soenda Islands would be safe, and that in August we would be able to visit the East Coast of Sumatra. At that time, April 12th, we were planning so far ahead!

At tea, which we took with Consul General Earle Dickover and his wife, Mr. Dickover complained that his little garden was simply alive with immense snails, and in order to keep anything growing there, it had become his nightly chore to go out and hunt them. A haul of 350 to 450 was not unusual, as the records he had kept showed. With a flashlight we went to look at them. I thought of the pest of land crabs in our own garden in Florida, but after seeing the damage the snails did, I am satisfied that we should not complain—snails are much worse. God forbid that we ever get them here.

Dinner with the Van Mooks was like a quiet dinner in Washington, for they both speak English and are widely travelled, and Dr. van Mook had spent some time in the United States. He told us of his plans for the enlargement of the research staff of the Botanic Gardens and of Dr. Bass Becking's mission to Europe, where he had gone to pick out the scientific men who could carry out the plans. It was evident that he understood the rôle which scientific discovery would play in the development of this vast region, teeming with its races of humans, many millions of whom are just emerging from the lower levels and are wondering what "civilization" is all about.

Of the effects of the terrific impact of Western inventions upon those millions, Dr. van Mook was probably less keenly aware; and of the invasion coming down from the North he could have had little suspicion. Singapore was "impregnable" in those days, and the American fleet was stationed at Pearl Harbor. Both he and Mrs. van Mook belonged to the Netherlands Indies rather than to Holland, having both spent most of their lives in the East, finding there a larger field for their activities than they could in Europe. Indeed, wherever we went we found that the number of Hollanders who

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now prefer to spend their lives in Java, and other islands of the Indies, has increased very much since the last war. This appeared to be due in part to the increased comfort afforded by electric refrigerators, fans, and radios—and also to a sense of security in living so far from the turmoil of Europe!

While we were at dinner, Marian's attention was riveted on the wall-covering of the dining room, and Dr. van Mook seemed pleased to have it admired. "It's the 'Agel,' the material from which the sails of the Makassar praus are made," he said. "It comes from the leaves of the 'Gebanga' palm, *Corypha elata*." This palm is the same species as that known in the Philippines as the "Buri." Thanks to Dr. van Mook's kindness, large specimens of this beautiful material are on exhibition in the Museum of the Fairchild Garden. Along the coast of Celebes, we had admired the sailing canoes, but not until we arrived in Makassar did we appreciate what airy swiftness these craft can attain by using this Agel matting.

A Palm Sugar Expert

TWO and a half hours of flying took us back to Soerabaya. The pilot indicated to us in a general way the location of the emergency landing fields, but there was no evidence of the slightest suspicion of an invasion. I felt the romance which I always feel in a plane and which comes perhaps from my memories of that very first public flight of a heavier-than-air flying machine, the flight of Glenn Curtiss in 1908, when he flew a measured mile over the vineyards of Hammondsport, N. Y., thirty feet above our heads, and the dusk shut his landing from our view.

From those days in Soerabaya, which were filled with all sorts of doings, including a visit to Daan Hubrecht's sugar estate and final arrangements for getting off, two outstanding events remain in my memory. One was the day spent among the Lontar palms of Grisse with Dr. J. H. Coert, an amateur naturalist, during which I "made the acquaintance," so to say, of a real expert in the art of tapping these trees for their sweet sap. A man who has climbed, every other day for years, without climbing irons, to the top of a fifty-foot shaft, has straddled its giant leaves, and with a pair of wooden pincers has macerated its hard flower clusters to fit them for tapping, has a "story." It is a story which in my opinion is quite as fascinating as that of the line-men who hang on the poles and string the wires of our telephones. Our "expert" had one pair of pincers which he called "Gapit lakke", for mashing the male flower spikes, and another for the larger female flower spikes which was called the "Gapit pram-

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poean." For the Lontar, like the date but unlike most other palms, bears its male and female flowers on separate trees. Botanists have sometimes disputed as to when sexuality in plants was discovered, and the suspicion is warranted that the date growers of Assyria must have suspected sexuality centuries before the scientific botanists. The sap collectors of the Lontars, I should judge, found out that their palms were of two kinds, and that only one bore fruits.

When I talked with this man, I found that there was much more to his trade than I had imagined, for when he climbed up into the crown of big leaves he not only pared down the sharp edges of the leaf stalks, which otherwise would cut his legs, for they are as sharp as razors, but he also gathered such of the leaves as were mature enough to be used in the making of baskets and hats, and so forth. Fermentation soon turned into toddy the sap he collected every day from the cut-off ends of the flower stalks he had mashed previously. Then, too, the sap he collected was often made into that delicious palm sugar called Jaggery, sweeter than barley sugar obtained from malted barley.

I found it fascinating to interview this expert, quite as fascinating as it had proved in my early days of travel to interview the brewmasters of Munich and Pilsen. But had I given this fellow a glass of beer, he would have spit his first mouthful out; and the Munich brewmaster would have thrown the toddy away. "*Chacun à son gout.*"

The other event was a luncheon with Governor van der Plas and his wife. He is the Governor of East Java, and his long sojourn there has given him a keen interest in the native arts of the Javanese. He gave us an account of a new Christian church, built entirely by Javanese according to their own conception of Christianity, but we had no time to visit it. That they have a very keen sense of proportion and most exceptional taste in the combination of colors, he thinks is unquestionable, and he maintains that while more gaiety and lightness are to be found in the arts of the Balinese, there are greater depth and seriousness in those of the Javanese. It is an older culture,

A Palm Sugar Expert

in much the same sense, perhaps, that the Chinese is an older culture than that of the Japanese. We regretted that we could not see under the Governor's guidance a really classical Javanese dance, and he postponed the invitation until our return.

At last we were aboard the *Chêng Ho* again, having added a "mud pilot," Captain de Klark. The anchors were hoisted at four P.M. of April 16th and we were off on our new start for the Moluccas—our voyage into the Great East or *Groote Oost* (as our permission from the Admiral read), the archipelagos that lie East of Celebes. As the *Chêng Ho* took us out along the coast of Madoera and South of the Kangean islands, we stood and watched the setting sun light up the gay sails of the native praus—those boats of the kind which Wallace used when he visited the Aroe Islands, where the birds-of-paradise live. Those islands and the Kei group and possibly a touch on New Guinea now seemed possibilities on our itinerary.

XXIII

At the Gateway to the Great East

ALTHOUGH known for years as the Key to the Moluccas, Makassar, when I saw it in 1899, made a rather sad and dreary impression on me. An old stone fort, a single roadway along the shore, which began and ended nowhere in particular, and a few "godowns" or warehouses on the shelving beach, are all my recollection brings back from the day Mr. Lathrop and I spent there. When I saw it this time, it had changed completely, having become a great emporium, with nearly a hundred thousand inhabitants, of whom 3,600 were Europeans. There was a look of prosperity and of business activity on the good paved streets, and the only thing that recalled my early visit was the water life. The same wonderful sailing praus swept here and there across the harbor, sometimes passing the Marconi-rigged yachts when the breeze was light.

There was something very friendly about Makassar. Nowhere had we had such a delightful place to land as on the dock of the little Swimming Club, where we were also offered the privilege of its café and bathing beach.

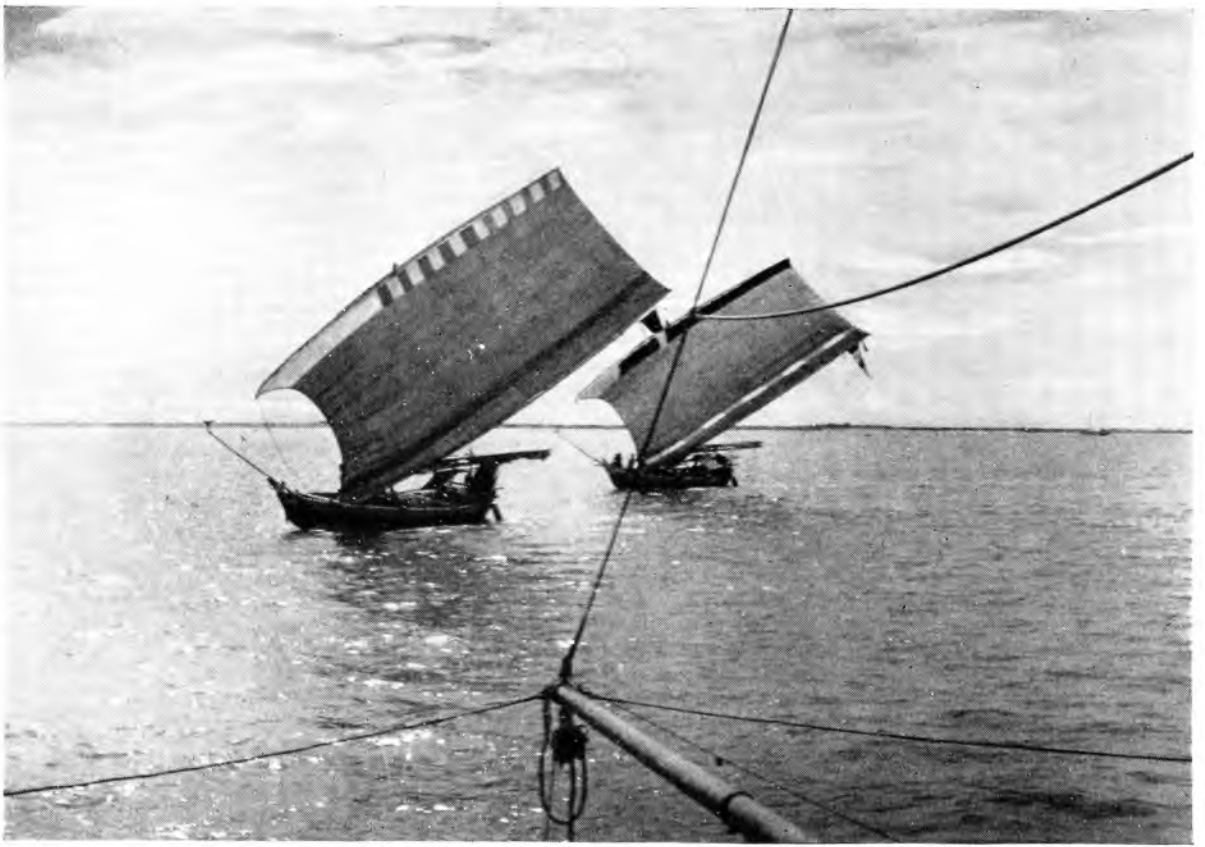
Ned Beckwith and Hugo Curran had not yet arrived from the back country but were expected at any time. Mrs. Archbold and Marian decided to hire a car and go up into the Toradja country over the rather recently opened highway, but as I still had the seeds I collected in Bali, which, due to a quarantine misunderstanding had not been mailed in Soerabaya, I felt that I should stay in Makassar and get them into the airmail without further delay.



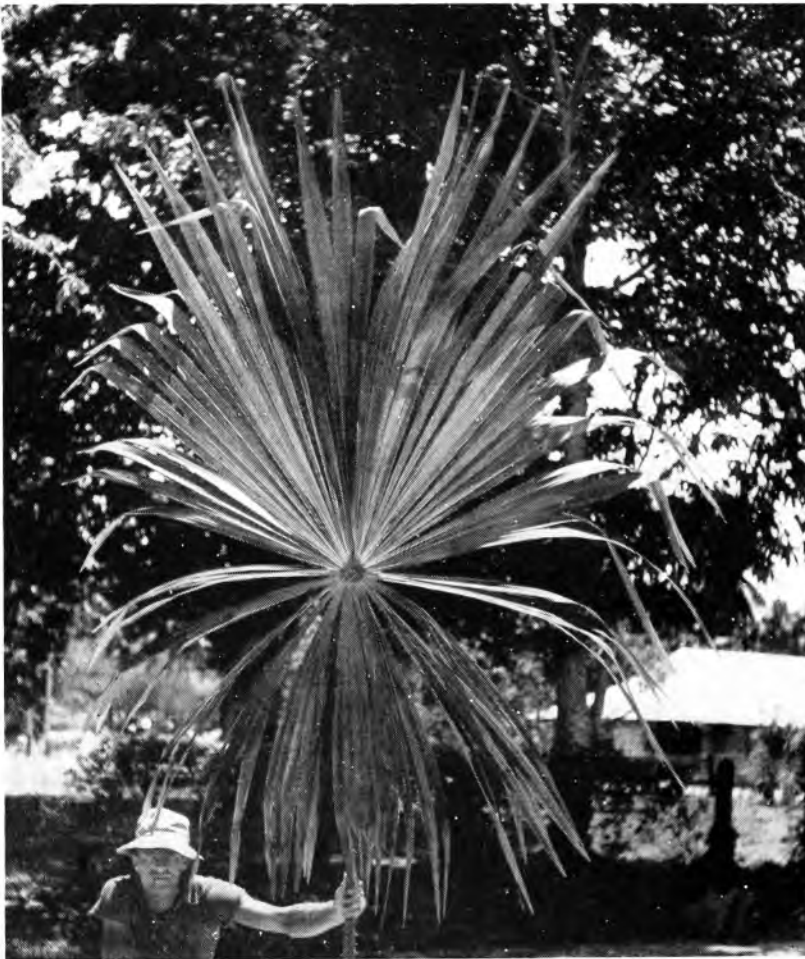
We visit the Fruit Station of Pasar Mingoe, near Batavia, in company with Dr. Ochse (left) and Mr. de Young (right). The ladies are sampling Ramboetans and Djerooks offered by Mr. Postma.



These twelve thousand seedlings, ready to be grafted, in the nursery at Ragoenan, prove that in Java the Durian is no mere curiosity.



The Makassar praus, with their large sails of woven palm fibers, can go as fast as a Marconi-rigged yacht.



Left: We are familiar with large fan palm leaves, but this one of *Pholidocarpus*, from Masamba, Celebes, is enormous. *Right:* Though this *Orania* palm from Celebes looks much like a coconut, its fruits are no larger than billiard-balls.

Guavas for sale in Makassar, each on its own string.



Try to get at the tender, juicy bud—the tree's only one—protected by these spines, and you will realize that palms have developed barbed-wire entanglements more efficient than man's.





With no other climbing aid than a small rope ring, the palm sap gatherer scales his tall palms every day with his wooden pincers (shown in detail at left) dangling from his belt. Reaching the crown of a Lontar palm, he bruises a flower cluster with the pincers, so that it will "bleed" freely when he cuts off its tip.

At the Gateway to the Great East

In Buitenzorg and Batavia I had discovered that the Moluccas were not well known there; they were a long way off and the chances for scientific men to visit them came rarely. "Makassar is the place to get first-hand information. Go to Dr. F. H. Endert, Inspector van de Groote Oost," I was advised. From experience I have learned that it is one thing to set down on cards and maps in the library the names of plants which occur in a region and which you think would be valuable to collect, and quite another thing to use those cards in the field. Locations on a map are all very well, but they do not tell you how long it takes to go from one of them to another. They are not time-space but merely space representations. Only local information can tell you the present condition of the roads, the availability of guides, the condition of wharves, the likelihood of rains, and the presence of known fever-infested populations.

Here we were, going into places which no Dutch botanist had had the chance to visit because of lack of transportation such as the Junk afforded. I was determined to start out as well informed as the limited time at my disposal would permit. I found Dr. Endert in his office in the old fort. He proved to be a scientific-minded person who gathers information from every source because of his own keen interest rather than because he has been asked to do so, and he imparted it freely to us.

The weather was pleasant, and as I rode through the streets in one of the curious little tricycles propelled by manpower, I wondered if Makassar was a comfortable place to live, and how it compared with Coconut Grove, for example, where we have a rainfall varying from 42 to 77 inches. Dr. Endert's records showed that the annual rainfall in Makassar was 111 inches, as compared with 46 inches at Singaradja on the North coast of Bali, and only 27 inches at Koepang on the West coast of Timor. "But," he remarked, "some months it rains all the time here and we do not see the sun at all. In 1940, in January, 51 inches of rain fell and it was very warm."

We discussed the possibilities of collecting in Ceram, an island

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half the size of Holland, and in Boeroe, a third as large as Holland, and in Halmahera, sometimes known as Djailolo, which is even larger than Ceram, and in the Batjan islands and many others which few Europeans have visited. I realized what a great undertaking it would be to "explore" even one of these islands thoroughly, and how inadequate was the small government staff of botanists to collect the plants of this vast region, even if one ignored entirely the jungles and mountain ranges of New Guinea.

"You will find very few Europeans in any of them," said Dr. Endert. "Amboina, or Ambon as we call it sometimes, has a Resident, Minheer Jansen, who takes an interest in our scientific work. He will know if there are any botanical collectors at work in Ceram or elsewhere."

Where I would find the richest palm flora, he of course did not know. The Batjan islands and Halmahera would be excellent places to hunt for them, he thought.

The old fort in which Dr. Endert had his office was an impressive one, and housed also an interesting little museum. The fort had been built in the time of the Portuguese, by the Makassars of the former Kingdom of Goa, but in 1667 the Dutch Admiral Speelman captured it and made an agreement with the Makassars which bound them to do business only with the Dutch. Stepping in as I did from the streets of what looked like a new city, and knowing that we were about to start off into a little-known wilderness, it was hard for me to realize that, a hundred years before the American Colonies declared their independence from Great Britain, Holland and Portugal had been fighting here for the possession of this fort.

When we went to make financial arrangements for what we thought might be a long stay in the Moluccas, I discovered to my discomfiture that our letter of credit would expire before we could get back from the Great East. "I can give you a letter to a correspondent of ours in Ambon," the banker said, "and ask him to help you out if necessary, but I cannot guarantee he will do it." We were certainly at some kind of a jumping-off place. Mrs. Archbold felt

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sure, however, that the agents of the Standard-Vacuum Company would always help her out.

Mr. Lassiter, the Agent in Makassar, arranged through the Chinese shops to get us several bagfuls of Chinese "cash" and coin of small denomination. We had on board a lot of jewelry from the five-and-ten-cent store in Washington, which we proposed to use as barter, and in Makassar we added tobacco and salt. Captain Kilkenny, who had sailed through the islands only two years before, had brought along about a gross of little bottles of perfume and fragrant hair-oil from Hong Kong. And I had stocked up on toy balloons for the children we should meet.

We were delighted to welcome Ned and Hugo back, and they were ready for the comforts of the Junk. They had visited Poso and Dongala, had seen the dry region of Paloe, and had penetrated as far as Gimpoe. They had traversed the highways of the southern peninsula of Celebes as far as Masamba.

Hugo's collection of seeds and Ned's collection of beautiful photographs are lasting souvenirs of their journeyings, which, although sometimes a bit hard, had been fascinating to them. Ned's colored slides of Celebes have never failed to interest the many audiences to which he has shown them, and I am reminded of Hugo's plants by a rapidly growing *Tournefortia* vine which seems bent on getting to the top of one of my large oak trees here. When it does, it should please its American audience by "beautiful, pearl-white fruits arranged in two rows, brooch-like, on the branchlets of the cluster," as Ned's photograph shows. Hugo's *Clerodendrum minahassæ* from Masamba has become a tree, and its beautiful white flowers, four inches long, have borne fruits, and these in turn have grown into lusty little seedlings in a flower pot. This spring I planted out a seedling of his ficus tree from Paloe. Already it is eight feet high, and begins to frighten me by its rapid growth. But its leaves are superb structures which one's hands instinctively reach out to feel. These are but a few of the seventy-odd species of which Hugo collected ripe seeds, many of which are growing here.

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Quite by chance, Ned and Hugo had met up with Mrs. Archbold and Marian at the strange tombs of Makale, which are square openings cut into the face of the tall cliffs, sometimes forty feet above the level of the surrounding country. At one place there are seven tombs with a balcony in front of them, and on it are seven life-sized colored figures representing the men and women interred, all dressed up in the clothes they had worn when alive. To come upon them unexpectedly, as the ladies did, is a startling sight.

XXIV

Landfall in the Spice Islands

AT last we were together again after the long interruption, and were away on our new start for the Moluccas, retracing our course through the strait of Boetoeng and anchoring at Raha for the night. One of the propeller shafts broke during our passage through the strait, but this gave us little anxiety since we were headed for Amboina, one of the naval bases, where it could be repaired.

As we approached the point of land known as Nanka on the West coast of the little island of Wowoni, I saw, rising above the forest and almost on the rocky shore, a striking, dark-green forest tree, fifty feet or more in height. It was so beautiful and so evidently able to withstand the salt spray that it was with considerable excitement that I landed in the launch and climbed up the bank to where it stood. There was no doubt about its being a *Casuarina*, (related to the so-called "Australian Pine" which has done so well in Florida), and a very handsome one. Looking up through the dense, needle-like, green branches which serve as leaves I could see some round fruits, an inch and a half in diameter. As each fruit, or cone, could be expected to have numerous seeds in it, I began counting my chickens. Hugo, with the climbing irons strapped on his legs, scaled the tree and threw down every fruit he could find. One after the other I examined them minutely—only one of them had a chance of yielding living seeds. It was a bitter disappointment. We looked for seedlings under the tree, but in vain. We scoured the coast, but found no other trees of this species. I nursed the cone in my laboratory on

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deck and it yielded a few seeds of doubtful viability, but they perished on the way to Coconut Grove. Should any one who reads this book ever fly over the island of Wowoni, let him remember that upon its shore there is a beautiful tree which should be in cultivation here, and let him get some seeds of it if he can. It may occur elsewhere of course, perhaps in New Guinea.

Should that reader land on Wowoni, let him also get some seeds of a slender palm with claret-red flower sheaths and flowers borne on pink stems. The flowers are ivory-white when young, but turn a beautiful red as they open. The fruits turn purple-black on ripening. The palm, which may be a *Pinanga*, occurs in large groups back of the mangrove swamps on this tiny island off the Southeast coast of Celebes.

As soon as we had rounded the North coast of Wowoni island we struck East across the Banda Sea towards the island of Boeroe, nearly 200 miles away. It would be our first landfall, as they say, in the Moluccas, and we were excited, all of us.

Here at last we were steering for one of the three largest islands of the Moluccas. The Netherlands East India Company had built a fort on it in 1657, and from the island the famous Cajiput oil of commerce was exported before even the Portuguese visited it. Alfred Russel Wallace spent the months of May and June here in 1861, wading barefooted through the muddy swamps. Here he collected sixty species of birds, no less than seventeen of which were new; and got the skull of the curious, four-tusked wild hog, *Babirusa*. From this island he finally quitted the Moluccas, "among whose luxurious and beautiful islands" he had "wandered for more than three years."

It was on Christmas Day in 1856 that Wallace on his way eastwards in a native prau bound for the Aru islands, had sighted Boeroe "forty miles away." Right now we were crossing the trail of the great naturalist, whose searching intellect had tried to determine, by means of the way in which the living animals (birds and insects in particular) were distributed, the geological history of the islands

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of the archipelago: how they had been formed and the order of their formation. He describes "one of the finest insects" which he found. It was a beetle, a borer, with antennae five inches long. On the same page of his book he says, "It sometimes amuses me to observe how a few days after I have taken possession of it, a native hut seems quite a comfortable home."

Wallace's picture of Boeroe is of a low, swampy island where it rained much of the time and where there were no roads—only trails through the mud. I had not found any one in Buitenzorg or Batavia who knew much about it, and I had begun to wonder if its West coast, towards which we were steering, was as bad as the East end, when Kilkenny called me out on deck. Through his glasses he showed me the Kakoe Palatmada mountain range, with a volcanic peak rising over 7,000 feet high and several lower peaks close behind it.

This was at 3:30 P.M. on the last day of April. The sea was glassy calm, and there, dead ahead, lay Boeroe. The following morning Mt. Tomahoe, as it is named on the charts, towered above us, its base shut from view by two narrow, sandy islands covered with low forest, but its limestone cliffs distinctly visible in the morning sunlight. Dense forests covered the whole scene. The fact that no clearings were visible showed it to be a sparsely inhabited region. It was magnificently wild, and now, as I gaze through my lens at the photographs I took that morning, something of the thrill of those moments comes back.

Earthly Enchantment at Boeroe

AS the *Chêng Ho* drew in closer, the long island of Tengah, which with another island formed a closed-in bay, proved too inviting for us, and we scrambled into the launch and made for its beautiful white sandy beach.

There was nothing on the chart to indicate the entrance to the harbor; so the other launch went in ahead of the Junk to make soundings, and to mark with empty gasoline tins a channel through the maze of coral heads. It soon disappeared from our sight.

As soon as our keel struck the sand we were wading ashore towards a giant tree whose branches nearly touched the water. Imagine Marian's and my surprise to discover, as we looked up into its branches, that we were under our own pet tree *Hernandia sonora*; the same species as the one which stands beside our porch in The Kampong and shades it from the afternoon sunlight. By another of the coincidences so common in my life, this *Hernandia* was the first tree we collected on our expedition to the Dutch East Indies in 1926, and now it was the first to greet us in the Moluccas.

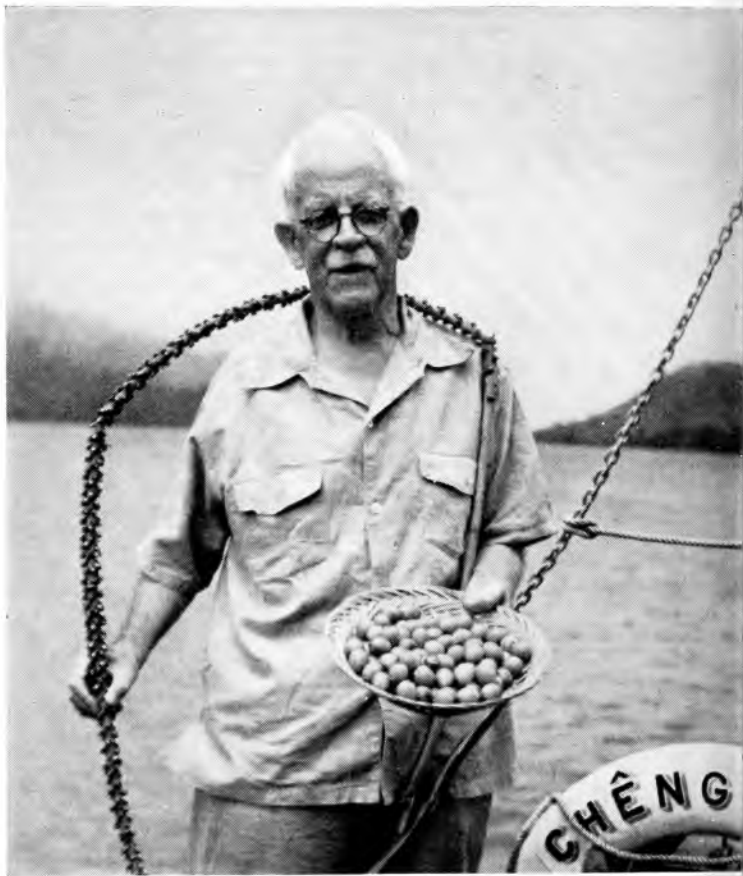
It was a perfect day; the beach was covered with new and beautiful shells; the cliffs above us had palms on them that I had never seen before; there was a trail leading off across the island. We all scattered. The ladies went along the beach, Hugo and Ned climbed into the hills, and I took the trail which led me to the thatched sheds of a primitive still. Some leaves of the cajiput tree, *Melaleuca leucadendron*, were fermenting in a bin, preparatory to being steamed in

Ned Beckwith hung the plants we brought him amidships on a line and photographed them one by one. He contributed his collection of superb photographs to the Expedition. Many people have enjoyed his lectures and seen his colored slides.



Palm seeds, enlarged. To make sure they are alive, you must split some open to find if their embryos are plump and fresh. The tiny embryo may be anywhere in the seed.
Rophaloblaste sp. from Kasirocta.

Hugo brought down from Mt. Tomahoe this beautiful eight-foot spike of scarlet fruit and threw it around my neck. I had seen the *Calypterocalyx* palm before, in Ceylon, and had fallen in love with it there.



Landing in the Moluccas, we found ourselves under a *Hernandia* tree like the one that shades our porch at home.





This scene unfolded before our eyes on that May morning as we approached Boeroe. None of us on deck dreamed that we were to anchor in a harbor so beautiful and so wild that its memory would haunt us ever after.



By his request, Rumphius was buried in the garden of his little house in Amboina, where he worked for over half a century to show to the world the beauty of tropical forms of life.



The portrait of Rumphius which appears as the frontispiece to his great work, *Amboinsch Kruidboek*. Published in 1741, it took rank as the most remarkable book of its time; its descriptions of hundreds of new species of plants and animals stand today as models of accuracy and care.

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the process of extracting the cajiput oil. There was nobody in sight. The bamboo water-pipe that trickled its stream of water through the still disappeared up the hillside path into the forest. It seemed a deserted countryside, but as I wandered about over the trails I saw, half hidden under some palm leaves, two large gourds filled with liquid. Then a palm near me rustled, and from its top peered down at me the face of the native sap-collector whose gourds I was looking at. I doubt if he had seen many white men before. Kindly fellow that he was, he offered me a drink. I was thirsty and the palm sap was delicious and refreshing. Though it had been collected only a few hours, it already had a tang, like cider a week old.

I wanted to take some to the others on the beach. There was no receptacle of any kind about. However, there were clumps of bamboos everywhere, and with his knife the native cut two lengths, filled them from his gourds, and I carried back two quarts of palm wine in my arms. By this time it was midday and getting hot; so we sat and drank the wine and opened a few milk coconuts.

Nearby I noticed a tree with large pods on it, reminding me of the Lebbek tree whose seeds I had collected in the nineties on the road from Cairo to the Great Pyramids. With sticks and stones we knocked down a number of pods and I tried to open one. It refused to be opened, resisting my knife and turning the edge of the blade. I tried to smash it on the rocks, but it was too tough. When I got the pods back to the boat I was able to open one with a pair of pliers. I had little doubt that the seeds would carry alive, and they did. Plants have been sent out in Florida to amateurs who want a shade tree in their yards. Dr. Merrill has given the tree a provisional name, *Serianthes*, and interestingly enough, it is related to four other species of the great family of Leguminosæ which have made their permanent homes in Florida.

As we sat there, all of us, that first morning in the Moluccas, Anne turned to me and said, "Well, David, you have not exaggerated their beauty. This is wonderful."

We all went back up the trail to look at the still and follow the

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process through, from the fermentation and the steaming. Ned found in the "worm," which was kept cool by a trickle of water from the bamboo pipe, a quite adequate arrangement for proper distillation. The greenish oil was all under contract to the Chinese and we found it difficult to buy any. What improvements this method of distillation represents, it would be hard to imagine; the machinery is still so primitive. But the oil seems to have been known to natives of Boeroe long before the Hollanders came to the Moluccas in the beginning of the 17th century, and it found its way into Europe in the commencement of the 18th century. The island was known as the principal source of the oil in the nineties, and I had made my first acquaintance with it when I came down with a fever on the *S. S. Japara*, when Mr. Lathrop and I were off the Aroe islands. Pandok, our Javanese "boy," anointed me with it and the cabin was filled with its pleasant odor. Now our cabins on the *Chêng Ho* were redolent for some time with the fresh oil we got in Boeroe—its original home.

The cajiput tree has become known and much appreciated in Florida, following its introduction by my friend John Gifford. Used first as an ornamental dooryard tree, it is now spreading over many acres of the Everglades; so this glimpse of it in the island where the oil from its leaves has been distilled for centuries had a special interest. Whether a product comparable in quality to that of Boeroe would be yielded by the trees on the Everglades, grown under such different conditions, only experiments would decide.

When we joined the *Junk* again on the other side of the narrow island of *Tengah*, she was anchored in the glassy, blue waters of a perfectly idyllic little harbor. Rising above it was a superb mountain, higher than Mt. Washington, with white limestone cliffs over which tropical lianas were festooned. Along its base was a wall of mangrove trees, into which led inviting bays where streams from the mountain met the sea. Dark, stormy-looking clouds had already concealed the peak, and fleecy clouds on the mountainside cast their shadows on the dense, deep-forested slopes.

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The hills of the island we had landed on were covered with grey-leaved cajiput trees set sparsely in tall grass, while the sandy beach led away into a quiet, shallow little bay that was filled with marine life and proved irresistible for wading and swimming. Not a foot-mark was to be seen anywhere; not a single native habitation was in sight. This whole superb bay seemed waiting for us; nobody had told us there was such a spot in existence. And here we were in a boat the color of whose sails and whose Oriental form were in perfect harmony with the scene. Once again Marian and I were in a spot so beautiful that those words of Faust came back to us: "*Verweile doch! du bist so schoen!*"—as they had in the oasis of Bou Saada in North Africa years ago. Yet what two scenes could be more unlike? A desert landscape stretching away to the horizon, and this place where every feature seemed covered with plants that dripped with moisture and reflected the sunlight from their myriads of leaves.

Hugo picked up a man to go with him and was off up into the mountains. He found no good trails and had to walk in the stream-beds which were very slippery because there was so much lime in the water that came down from the cliffs. Knowing that I am not very good on slippery paths of any kind, he advised against my attempting these trails, although he found the *Pigafettia* palm growing abundantly, along with another of the choicest palms of the world, *Calyptrocalyx spicatus*, which two, of all the species I have seen, are my especial favorites. He found this latter palm very common along the stream valleys at 1500 feet elevation on Mt. Tomahoe, growing in limestone soil. The trees have perfectly straight trunks thirty feet tall, and their long single fruit stems, eight to ten feet in length, are studded with large red fruits, an inch or more through, that make a streak of bright red in the forest where the sunlight strikes them. Specimens of this superb form are growing in our slat-house here.

While Hugo was collecting on the slopes of Mt. Tomahoe, the others of the party were out in the launch exploring the varied shore-line of the bay. In places, rocky cliffs rose sheer from the deep

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water, and we had to push aside the overhanging branches in order to get close in. We discovered a number of things which are now growing in Florida. One of them is a scarlet-fruited Pandan, or screw-pine; another is a strand tree with sweet red berries, as yet unidentified.

Farther on, the rocks gave way to mangrove swamps; often with streams running through them, and up these we went as far as we were able. On the stilt roots of the mangrove trees there were hundreds of snails, and since the ladies, and Kilkenny too, had begun their shell collecting in earnest, the sport was divided between what could be found in the branches of the trees and what could be found in the water along the muddy banks.

At nightfall we could hear plainly the sound of rushing waters, as if there were a river somewhere near. We followed the sound one day and came to a spring, low down on the rocky cliff, from which poured a stream of cold fresh water three feet through. Before we knew it, Ah Fook had his head in it and was shampooing his hair!

The stream was a real find for all of us, for we were beginning to be a little short of fresh water, as catching rain water on the awning had not proved entirely successful. During the ensuing days the crew spent much of their time hauling water and filling our tanks, and on every trip over they had a great time in the stream.

The charms of this unnamed bay were immensely enhanced by the fact that whenever we went out in the launch, in the clear water below us, we could see superbly beautiful sea gardens with corals and sponges, and shoals of fish darting through them, all of harmonious shades of color. The beaches were covered with lovely shells, and Mrs. Archbold and Marian would come back laden down with them, only to find that Kilkenny seemed to have even more than they did. In answer to questions he would reply, "Oh, I have my own reef." For some time the location of "Kilkenny's reef" was a mystery, until one day Marian, remaining on board, found that all the natives in the area were bringing him shells which he paid for with little bottles of perfume.

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At last it came time to go, though nobody wanted to leave. Before our departure, however, I decided to go up into the scattering growth of cajiput trees which covered the hillsides of Tengah Island, for I could see the grassy slope, and it looked inviting. I rowed across to the beach and entered the edge of the grass. This was higher than I had thought, and soon it was so tall I could barely see over it. The slope, instead of being dirt, was of uneven rocks, and after I had once or twice set my foot on a clump of grass and felt it go down into a hole, I discovered that I had undertaken a real task: it was like trying to mount a very irregular stairway completely covered with grass five feet high. I had been in this grass in the Philippines and in Java, but never in such a tangle of it. I knew then what Wallace meant when he spoke of "the high grass and cajiput trees—my dread and abhorrence." After an hour or more I reached the trees and looked off toward the Junk with the volcano behind it. Though drenched with perspiration and out of breath, I could not help wishing that somehow or other we might stay on in this paradise that seemed so far away from everything.

But at least the dream which I had cherished for forty years had come true—I was in the Moluccas.

The Straits of Manipa

WE sailed along the North coast of Boeroe, and anchored off the tiny little island of Manipa, getting a glimpse, as we passed, of the eastern end of Boeroe which is low and swampy; this is the populated end where Wallace had such an uncomfortable time. Manipa Island lies in the straits of Manipa, only forty miles or so from Amboina, and as the one good engine was carrying us along nicely, we stopped over for a day.

Magnificent old *Barringtonia* trees overhung the sandy beach, and the waves played with the large, square, floating fruits that dropped from the trees, washing them ashore, and picking them up again and taking them out to sea. Ned got some interesting photographs of them for my botanical friends, for next to the coconut, the *Barringtonia* fruits are perhaps the most curious of the fruits carried by the sea. Almost as light as cork and glazed over as with a kind of varnish, they can float for weeks, perhaps months, without perishing. It was maddening not to be able to pack up dozens of those which I found germinating a little distance back from the shore, and send them to plant on the Florida Keys, but they were too bulky for air transportation. I have one small tree on The Kampong here and its leaves are a delight to handle, they are so large and smooth and glossy; but a temperature of forty degrees makes these leaves turn red, and if the thermometer goes lower, they fall.

The rocky banks rose at a sharp angle from the beautiful beach, and to scramble up them through the tangle of vegetation was a slow

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business. I saw, some distance up the bank, a wild species of wax plant, a *Hoya*, similar to, but with much larger flowers than, the house-plant which one used to find everywhere in window-gardens. I hauled myself up by the lianas and got hold of its swinging slender stem, but as I pulled, I observed that the *Hoya* was climbing over a tree that was covered with black berries. These fruits, except for their smaller size, were so like those which Mrs. Letchworth gathers every year from my antidesma tree here by the study, that I tasted them and ended by eating a handful. And now I am having a time finding a location on The Kampong where I can plant out a tree which grew from one of the seeds that I picked that day. My little collection of different species of this fine fruit tree may encourage some one, some day, to breed them and perhaps make even better varieties than we have now.

When Hugo came back from his tramp into the forest he brought several interesting things: two slender feather palms, probably a *Pinanga* and an *Areca*; and an amazing species of *Clerodendrum* with flower spikes 15 inches long and 3 ½ inches through; it was something like a delphinium, except that it was of various shades of deep Chinese pink. He found it growing in sunny spots in the forest, at sea level, on the edge of a sago swamp. We had a time landing this in Florida alive, for there were no mature fruits on any of the spikes. There were, however, a few half-mature ones; so I hung the flower spike up in my laboratory where I could watch it every day. Only two or three fruits ripened, but Ray Vernon, the expert propagator in Colonel Montgomery's Palmetum, succeeded in getting one to grow.

One day Marian and I took our lunch with us to what we thought was a spit of land, but which turned out to be an island surrounded by mangrove swamps, and after Ah Fook and the launch had left us we found ourselves marooned. As we walked along the beach we came upon a little shrine made of sticks and palm leaves, and on its little platform were bits of dried fish, some sago meal, and other fragments I could not identify. It was just out of reach of

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the waves. Farther on we found a fishermen's camp and two natives cooking their dinner. Their canoe on the beach held a beautiful assortment of brilliantly colored fishes.

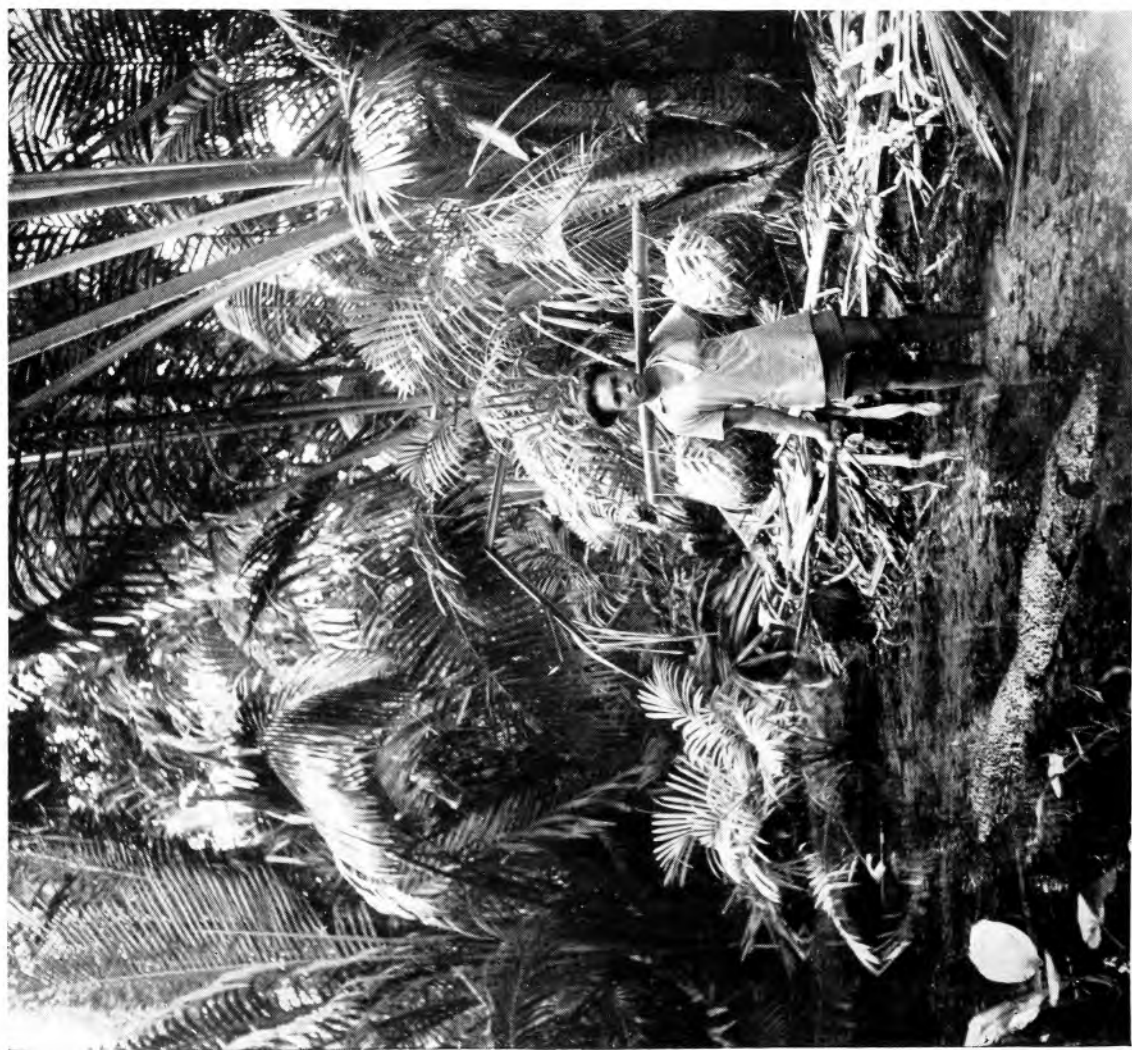
I doubt if either of them had seen "orang blanda" (white men) like us before, but they offered us part of their dinner, and helped us get down from a tree the largest ant-plant we had seen, even though the ants stung them severely. There was a second little shrine farther up the beach from the first one and I tried to find out what these fishermen thought the shrines were accomplishing. If they imagine that there are invisible beings about, as I think they do, then it would seem quite natural to make gestures of friendship toward them—and what could be better for this purpose than an offering of some bits of food? It would have been interesting to hear why they put the shrines right on the beach. Do spirits walk on the strand, going round and round the island? The natives of the Bahamas who hang bottles with bones, feathers, and other oddments in them, on the trees as charms, live in the same kind of a haunted world.

The Junk came to anchor in the harbor of Amboina shortly after noon of May 7th, between the wharf of K.P.M. steamship lines and the old grey stone fort. I recognized nothing I had seen forty years before, and there was little that looked attractive. I had carried on some correspondence with the head of the Protestant Mission in Amboina, Mr. Carel Hamel, who had collected plants for Professor Bartlett of Ann Arbor in Sumatra, and we started out to call on him before the afternoon rains should set in. Ned had many photographs to develop; so he took a room in the little hotel where he could have plenty of running water.

We found the Hamels charming people. Their son, who was much interested in natural history, piloted us to the office of the Resident, the Mr. Jansen of whom we had heard so much in Buitenzorg. He received us with the utmost courtesy, and, hearing that ours was a botanical expedition, took us into the library and brought out the volumes of Rumphius's *Amboinsch Kruid Boek* or *Her-*



Left: Sago makers at work with their bamboo adzes, digging out the woody pith of a Sago palm trunk which has been split in half. Baskets filled with the chips are in the foreground. *Right:* The Radja of Amboina showing us the hollowed-out shells of a Sago palm stem.



Left: In baskets of woven sago-palm leaves, the chips are carried upstream to the primitive washing machine on the river-bank. *Right:* Mother and baby are evidently getting the food essentials, for they are thriving on sago, their staple food.

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barium Amboinense, that famous illustrated work on the tropical plants of the Malay Archipelago. It is the work of a man of German parentage, G. E. Rumpf of Hanau, who came to Amboina in 1653 and fell in love, as a naturalist can, with the hundreds of fascinating plants which he found around him. He spent his life there, slowly going blind as he worked over his collections, delineating and describing the uses and characters of the plants he had collected. A fire ruined his sketches, and he was forced to make them over again with the aid of assistants. His first book, on its way to Holland to be printed, went down when a "Frenchman" attacked and sank the Dutch ship. Undaunted, he set to work and rewrote the whole book. This second book reached Holland safely but was not published until fifty years later, in 1741, long after Rumphius was dead. The book took rank immediately as the most remarkable work of its time, filled as it is with descriptions of hundreds of new species of plants, descriptions which stand today as models of accuracy and care. I had aboard the Junk a bibliofilm of Dr. Merrill's interpretation of Rumphius's described plants.

When I was in Amboina in 1899, I had made a visit to the grave of this great man, but now I wanted a photograph of the monument that had been erected over it, and the Resident invited us to come another day, when his daughter would be glad to show it to us.

Mr. Hamel introduced us to S. J. Rehatta, the Radja Soija, who took us next day into the interior of the island to see some of the sago makers at work in a cluster of big sago palms along a beautiful brook of crystal clear water. There is nothing in the agriculture of northern lands that bears any relation to this ancient and primitive method of taking food out of the inside of a giant tree. Imagine felling a tall tree, in this case a palm, two feet through, and chiselling out its entire insides, down to the bark, and then washing the starch out of the chips. There on the swamp land lay the two halves of the sago palm, with a workman in each one busily engaged in chipping out the white, central pith. Each man used an adze made of bamboo, the cutting edge of which was formed by the silicious outside of the

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bamboo stem. There was no metal anywhere about. The tools of the sago makers were probably devised long before the age of iron, and for their purpose these bamboo tools seem, many of them, much superior to stone implements.

Baskets woven of the green leaves of the very palm which lay prostrate before us were being filled with the chips, and borne on shoulder-poles to the washing device. This was the base of a gigantic leaf of the same sago palm. It formed a perfect trough, and at its lower end, a sieve of fibers from the leaf base of a coconut had been fixed. When the boys dumped their baskets of chips into the trough, the washerman pulled up the water from the stream in a palm-leaf bucket at the end of a bamboo pole, poured it over the chips, and stirred them vigorously. Quantities of milky water filled with starch poured through the sieve into an old dugout canoe placed to catch it. The starch sank to the bottom of the canoe and was scooped out and carried off to the shop in the kampong.

To make the pearl sago of commerce, this wet starch is rubbed through a sieve on to a hot plate which is kept in constant motion. When it comes on to the table as sago pudding, it is often confused with tapioca, which is made in a similar way from the root of the Cassava or Tapioca plant, a native of the Western world. The pith of many kinds of palms, and also of those related plants the Cycads (often referred to as "Sago Palms" although they are not palms at all), is charged with starch which can easily be washed out in the manner described.

As we stood watching these skillful workmen my mind's eye saw the long line of their ancestors, who had been felling this kind of tree since the very dawn of man's development. Perhaps—who knows?—*Pithecanthropus erectus* may have lived on the starchy pith of some one of the palms.

The Radja Soija took us through an orchard of fruit trees which he called "Gandaria" and of whose fruits he seemed to be very fond. March was their season, but by looking about carefully we discovered two small fruits. They had a delicate flavor reminding me of

The Straits of Manipa

yellow plums, and I determined to get more of them when we returned to Java, where they occur also. I saw when I got back to the Junk that Ochse had devoted a plate to *Gandaria* in his book; it is a relative of the mango, called *Bouea macrophylla*, and there are many varieties, especially in West Java. But the seeds I sent to Florida failed to live.

The Radja was a quiet, gentlemanly person with an attractive wife. They took tea with us on the Junk, and he told us that one of his ancestors had been the last King of Amboina before the island was taken by the Dutch. I imagined I caught a touch of resentment in his conversation—and who could blame him for being disappointed that the inheritance of a kingdom had been taken away?

The Jansens and the Hamels also came to tea, and the Resident's pretty daughter, Nellie, who spoke beautiful English and was altogether charming, brought a breath of romance on to the Junk. Nellie took us all to the home of Rumphius, which, though once destroyed by an earthquake, still has the old tile floor where his cases of specimens used to stand. In the corner of the small yard stands a very simple brick monument which has been white-washed, somewhat obscuring the legend. I thought the monument hardly commensurate with the fame of the man but quite in keeping with his modest life as a scientist.

War and Chaos Come to Amboina

THE day after we had paid our respects to the memory of this great German—a genius by any standard, for genius is not the “property” of any country or race—the Nazis invaded Holland and every German in the whole Dutch East Indies was ordered arrested.

Hugo had come in from collecting in a river valley back of town, bringing a palm neither of us could identify, for it had characters unlike any described in our palm books; and we worked over it in the laboratory late that night.

Unsuspecting, I went to the hotel on the main street next morning to see Ned and get him to go with me to the office of the Resident. He had many films hung up to dry; so I lingered to look at them. As I stepped out of his screened porch, an armed guard with a peaked hat and European uniform held his gun across the path and said in a low voice: “*Tida bisa.*” I argued with him in Malay, but he kept repeating “*Tida bisa*” or “*Tida bisa jalan,*” which means “no can” or “no can go.” I was dumbfounded. I took from my pocket a calling-card and scribbled on it a line to Mr. Jansen—I find it here in my notes as I write. The guard shrugged his shoulders. Then the Captain of the Guard appeared and I showed him the card. Speaking Dutch, he said that the Resident was not in his office. In a few minutes, during which Ned and I racked our brains to fathom the mystery, he returned and gave us permission to come out of the hotel. We mingled with a crowd, which had gathered in the basket-ball

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field; but no one seemed to know what was happening. We saw that there were several guards watching the hotel, and that something was evidently going on inside.

Then young Hamel rode up on his bicycle. "Holland has been invaded. They are arresting the Germans," he called out. The crowd grew, and I wandered about asking questions of every one, but nobody knew more than that the Nazis had invaded the Fatherland, where most of the Dutch residents had relatives, many of them children. The schoolmaster asked me to have a cup of coffee on his porch. His wife was talking about the banker to whom the Makassar Bank had given me a letter of introduction and whose house stood beside theirs; these next-door neighbors were now packing their boxes for an enforced trip to the internment camp in Java. "I have never liked them; I've always been suspicious of them," she said, "and there are a lot of Nazi sympathizers in the hotel, too." A cablegram had reached out and upset the life in this quiet village, throwing into jail men and women who the day before had been lunching or playing cards together, for there were also Nazi sympathizers among the officials and businessmen.

I shall never forget the bewilderment of those moments. A veritable hurricane of insanity seemed to be sweeping everything into confusion. The spread of a disease like flu seems quick enough, but here I was witnessing the spread of something immeasurably more contagious and more rapid, the spread of an idea which has infected primitive man from the time of the cave-dwellers—the idea of war. What it was all about, many of the onlookers around that hotel had not the faintest idea. It was "prang," war, and that was all.

To give in sequence the occurrences of the seven days which followed is beyond my abilities. It rained in torrents nearly every day, and the sun rarely came out for more than a short time. Amboina is a naval base, and immediately we were interned, with five armed guards parked on the little deck where usually we spread our mattresses at night. To ensure our remaining, the Harbormaster took charge of a piece of our engine machinery. Cablegrams went out to

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the American Consul General and the Dutch Admiral and Dr. van Mook in Batavia. Our Dutch "mud pilot," Captain de Klark, packed up and left. Kilkenny, as a Naval Reserve officer, wired the American Consul. Mo So, our engineer, was at work in the shipyard, turning out a new section of our shafting to take the place of the one which had broken. Hugo was forbidden to go outside the town, as there was danger that the excited Amboinese might mistake him for a German and shoot him. The beaches were closed to shell collecting, of course. There was a rumor one day that the Japanese airplanes were coming, and the streets were soon empty. A murder was committed in the downtown section. The Chief Controller and his Hungarian wife were arrested as Nazi sympathizers. Machine-gun nests were hastily put in, and refuge shelters built in the hills. Patrol boats came and went in the harbor; an occasional airplane passed overhead, but there was a general opinion that the place could not be defended against a Japanese air attack. The wharf was guarded and we had to go and come by the pier at the old stone fort, passing sturdy little Amboinese soldiers, the cream of all the fighting forces of the Dutch East Indies.

The Resident said at his office he could do nothing for us, as the Commandant had taken over. With four of his children in Holland near the battle zone, and with his friend the Controller declared a Nazi sympathizer, interned, and about to be sent to Java, it seemed to Minheer Jansen as if, overnight, his world had crashed around him. I can see his tragic face as he bid us good-bye. "I'm afraid you can't see the lovely island I wanted you to see—Misool. I'm sorry," he said. It is strangely sad that it was to be his fate to die of pneumonia in a Japanese internment camp, there in Amboina.

Our farewell call on Madam Jansen was tragic too, for she also was thinking of their children and of her own home, overwhelmed by the German army advancing through Holland. What will become of her and of her charming daughter Nellie and little son, I wonder?

Then there was the quick transformation of Commandant Scholten's dwelling into the headquarters of the army forces, with guards

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around the front yard, and Mrs. Scholten helping in the office work; all of which I saw when I went to ask that he cable to the Admiralty in Batavia to release the *Chêng Ho*. His courtesy towards me during what must have been most trying moments, I shall never forget. When he found I could read Dutch, he got from his library a book on the Moluccas and made me take it off to the Junk to read.

The Hamels were preparing to leave for America, and by one of our many coincidences, we found them on the same freighter when we finally returned across the Pacific. From America, they went back to Java, leaving some of their children in school, and now they have disappeared into the Japanese war clouds.

A cablegram came at last from Batavia, but it ordered us to clear for the Philippines direct. We were relieved that permission had been granted us to go, but bitterly disappointed that we were apparently not supposed to stop in any Moluccan islands on the way. To be at the goal of a lifetime's dream, and then to be unable to remain! It cut very deep, philosophers though we imagined ourselves to be. But our disappointment seemed utterly trivial in comparison with the great tragedy around us.

Here is Marian's note on our last afternoon ashore, when we said our own farewell to Amboina:

"As we reached the confines of the town, outside which we were not supposed to go, a boy passed us leaving handbills on the doorsteps of the little thatched cottages which told them how to black out their tiny candles and kerosene lamps. We were told later that these handbills frightened the people so that they deserted the town and fled into the wooded mountains.

"We looked long at the little brown people in sarongs; watched some children at play, and a woman stepping out into her dry sarong from the wet one she wore at her bath in the stream. We lingered at the tiny booths along the roadside, each with a few piles of red peppers, betel leaves, and doekoes, and a palm basket or two on display, and admired again the bamboo fences and the hedges.

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"Then we went to the Harmonie Club and had some cold beer and cheese, and we drank to the Dutch East Indies and to Anne Archbold who had brought us here and made all this possible.

"Then back to the Chêng Ho in a drizzle as darkness came down; and so good-bye."

Our orders from the Admiralty were pretty explicit, cancelling the "Entry Permit for Closed Ports" which Dr. Bass Becking had secured for us, before he went to Holland, from the Admiral of the Fleet in Batavia. They were written both in Dutch and in English. The latter version read: "The yacht Chêng Ho, brute capacity 426,8 m₃* is allowed to depart for the Philippines, without stopping at Batjan, such in connection with the circumstances, which do not permit further stay in the Netherlands East Indies. The Territorial Commander P. Scholten."

* These figures give the cubic meters; m₃ = cubic meters. D.F.

The Heart of the Moluccas

WHEN we sailed on the 17th of May it was still raining, for Amboina is one of the rainiest spots in the archipelago. As soon as we got out from under the rain clouds and into the sunshine, Kilkenny, whose buoyant spirits could never be kept down long, got out his charts. He and Ned, who now had become navigating officer, put their heads together, and we read and re-read the orders of the Territorial Commander.

The orders, we felt, were meant to insure our getting out of the Malay Archipelago and into the Philippines, that is, into American waters, with all speed; but they specified only one island where we were not to stop—the island of Batjan, largest of the group of that name. It would be exceedingly unpleasant, as Kilkenny pointed out, for us to go direct to Zamboanga, especially since de Klark's departure had left us short-handed, for night travelling through channels unmarked by lighthouses and with currents running at several knots an hour would be perilous. Then too, there might be engine trouble which would force us to stop, even though Mo So had been successful in making a new section of shafting. This had been a most remarkable job, as he had had to make it out of an old motor truck axle, with only an ancient lathe operated by coolie power—the only lathe in the shipyard.

Since we would have to anchor every night, and only Batjan was forbidden, we might work our way slowly northward and still have a chance to do a little collecting. It was true that we might be reported by some plane or police boat, and be turned back to Am-

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boina and held there for the duration; but on the other hand, our mission was thoroughly understood by the Admiralty, and it was a fair supposition that what the Admiral wanted was to get us out of the waters under his jurisdiction, where he was responsible for our safety. After all, the *Chéng Ho* was a Chinese Junk and Japan was at war with China.

So it was decided to proceed North along the coast of Halma-hera, keeping in sight of land, rather than to make the four-hundred-mile run across the open sea to Celebes.

Our first anchorage was in Dong Bay on the island of Mandioli. It was near sunset, and outrigger praus filled with people came out from shore to see us, their bows making ripples on the glassy surface of the water. The island was wooded and the houses were primitive; the people would be classed as "pagans" in any American Sunday School, but at least they had not heard the insane command issued to every one in "civilized" Europe that they must fly at each other's throats. "Prang" had not descended upon them. The peace of Dong Bay, after Amboina, I shall never forget.

Some day I should like to go back to Mandioli, not because it is a particularly beautiful island, but because its rocky shore is so much like that of the "rock keys" of Florida that plants discovered there might properly feel at home on Biscayne Bay. It was growing dark when we landed, and I found the going rather difficult because of the pot-holes. Great specimens of the cycad *C. circinalis* were entangled in the underbrush, and on the rocks near the shore I saw a spiny tree with quantities of fruits on it. As I was thirsty, I tried some of them. They were sweet and not bad eating, but I noticed that they were infected with a fruit-fly that seemed similar to the Mediterranean fruit-fly which caused such consternation in Florida in 1929. This fruit tree occurs in America too and when I consult *The Manual of the South Eastern Flora*, by my old friend John K. Small, I discover that it is a native of our Florida Keys and is called by him the "Tallow Tree," *Ximenia americana*. But he says nothing about its having edible fruits, and the fruits his tree bears are not a

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third as large as those I picked up on Mandioli. Ridley, the authority on Malayan plants, devotes a full page to it; he says it is called the "Jujube of the Seashore," that its fruits are eaten, are very sour, are pickled, are made into a beer, and that its hard nuts are cracked and the oily seeds used for many purposes. He says further that the leaves smell like bitter almonds, while the wood is fragrant enough to be ground and mixed with sandal wood. Burkill states that it is parasitic on the roots of other plants. I cite this case to show the danger which one is likely to fall into by following too closely the names of plants. Wild plants vary as well as cultivated ones.

Two days later we entered Kasaroeta Bay and scanned the low coastline for the mouth of a river which Wallace describes as one on which he collected. It is often difficult to make out the mouths of rivers which come down through mangrove swamps, but we located it at last. Mrs. Archbold, who was always keen to get out into the wild forests, ordered Ah Fook around in the launch the first morning of our stay in the bay, and we went up the river as far as we could go, looking for plants which were in fruit or seed. It was a perfect morning, delightfully cool in the shade of the overhanging forest trees. The water was almost cold. We found a native youth, Mahomet Sein, who was delighted to go with us and help collect, and we discovered several interesting plants; one in particular I recall which had the look of the Shell Flower, *Alpinia nutans*, but bore clusters of red fruits, eighty or more in a cluster, making a single string of fruits a foot or more long. When the fruits opened they showed rows of olive green seeds, a most unusual and decorative combination of colors. The seeds we sent home have grown and plants of it have been distributed; so in the course of time we may see this beautiful plant in the patios and dooryards of this region.

As we were walking along the bank of the river we heard the sound of a native drum. As Mrs. Archbold wanted one, I asked Mahomet about it; he said there was a kampong nearby and we would probably find it there. Then, cutting a long stick to protect us from something, which so far as I could make out might be either

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snakes or dogs, he led us to his own thatched home in the forest. The drumming continued until we came in sight of a woman sitting on the palm-leaf floor of a house which was raised above the ground on bamboo posts. She was amusing her naked little child by tapping with her fingers on the drumhead. Mrs. Archbold bought the drum and I gave the baby a toy balloon. I always carried some in my pocket, blowing them up, to the great amusement of the children.

To which race Mahomet Sein belonged, it would have been difficult to discover. Wallace found four distinct kinds of people in the Batjan Islands, none of them indigenous, but all stragglers of different races: Batjan Malays; "Orang Sirani" or Nazarenes, the Christian descendants of the Portuguese; Galela men from the north of Halma-hera; and the Tomoré colonists, brought from Celebes at their own request to avoid being exterminated by another tribe. These latter are the agricultural people who grow the vegetables for the villages. Only 18,000 people appear to be resident in this whole Batjan group.

We made various trips up this winding river, "Wallace's River," we called it. Wallace was so constantly quoted that he became a vivid personality to us all. One day Fenton said to me: "Doctor, I have a present for you. It's the only thing Wallace had that we haven't—guess what it is." With only a moment's hesitation I answered: "A native prau," and I guessed right. Fenton had bought one, paying for it, as usual, with a few bottles of perfume.

One afternoon Marian, Ned, Hugo, and I, with Ah Fook steering, took the launch far up the river to a bend where the tall trees cast so much shade that the undergrowth had been somewhat killed out. Hugo, who could go through the forest twice as fast as most people, started off by himself, leaving the rest of us to collect near the river. Ah Fook tied the launch up to the bank to wait for us.

It was to me a fascinating bench of land, with all sorts of new things growing on it. Here was the skeleton of a large python from which the ants had eaten the flesh. Over there were bunches of filmy ferns almost black in color. Curious mushrooms were scattered about. As we wandered along, Marian discovered right ahead of us

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one of the most striking flowering trees I have ever seen. It was evidently a lover of the deep shade. Its pure white, waxy "flowers"—not really flowers at all, but bracts—were fully four inches across; immense things they seemed, shaped like cups. Each cup was filled with little flesh-colored, secondary bracts that were immersed *in a transparent jelly*, so liquid that I could scoop it out and throw it away, uncovering the real flowers, which were little things of a dark lavender color. We succeeded in finding a few of the tiny, jug-shaped, orange-colored fruits, but although I took a lot of pains to get the seeds home, only one tiny plant resulted, and that soon died. The tree belongs to the order Rubiaceæ.

While Marian and I were busy making sure that we had some living seeds, and were getting our fingers covered with the slimy jelly contained in the bracts, in which all sorts of insects were feeding on the tiny fruits, Ned was skirmishing around in the forest nearby. "Do you know where we are, Ned?" I called out to him, for as all my friends know, I have very little sense of direction and I was already "turned around." "Oh, yes," he replied, "the river is right over here." We continued our collecting, while the sun got lower and lower and long shadows shot through the dense forest.

It was time to go. We caught up with Ned and soon found the river, in one bend of which we knew Ah Fook was waiting. On and on we walked, but nothing looked familiar, and all our calling brought no response. "Perhaps there are two rivers and we are on the wrong one," suggested Ned cheerfully. The way became more and more difficult; it began to get dark, and as we crawled over fallen tree trunks and under the lianas that barred the way, the possibility of spending a night in the jungle began to enter our minds. More calling brought no response from Ah Fook. And still we plugged along, through mud puddles and thickets of spiny palms. Without the sun shining through them, things had a different look.

There were no mosquitoes to trouble us, and it would not be cold in the jungle; so we might not be very uncomfortable. But we knew that it was likely to rain, and that would not be very pleasant.

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The maddening thing, however, was that Ah Fook could not be far away. We redoubled our calls.

Suddenly, from an entirely unexpected direction we heard an answering call, then another and another, and in a minute or two there appeared in the gloom the tall, gaunt form of Hugo, carrying a large palm stem on his shoulder. "What's the matter?" he said. "The launch is over here." He wheeled and strode off and we after him, and in a few minutes we found Ah Fook, anxious as he always was about his charges, standing in the launch.

The experience of being lost in a tropical forest, even for only half an hour, is worth while. I can recommend it to people I know whose conventional lives have given them an unwarranted confidence in themselves.

Another day, stopping on this same river to get a set of pictures of the local methods of sago extraction, we made the acquaintance of some really quite charming people who, so far as we could see, lived almost entirely on sago. Although the younger ones among them had probably never seen such strange looking individuals before, they were not in the least afraid of us. When we waved to them as we left, it was evident that they were really sorry to see us go.

It would be difficult to exaggerate the peculiar charm of the tiny islets of the Batjans, surrounded as they so often were with the most beautiful "sea gardens" of corals and sponges and sea-anemones and bright-colored fishes. The water was so crystal clear that it was not difficult to observe the minutest details of the life going on below, and to imagine oneself as actually forming a part of the landscape. There were large wooded islands too, with miles of sandy beaches on which we seldom found the trace of a footprint, or any other sign to show that human beings had been there before us. There were no tin cans or electric-light bulbs or orange peels to remind us of the "civilization" we had left behind.

Sometimes we skirted the rocky islands in the launch, finding interesting trees growing so close to the waves that their branches hung over them. We travelled many miles in this way, hunting for

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seeds which would form good ground-covers back of the mangroves.

I was always on the lookout for a very beautiful flower called *Bikkia* which Dr. van Steenis in Buitenzorg had told me about. He had shown me a specimen and had said it was to be found on the rocky shores of the Batjans. Another plant I wanted especially to get seeds of, was one of which Dr. Merrill had told me, *Acanthus ilicifolius*. I had seen it all down the coasts of the islands where we had stopped, but never in fruit. At last, after wading through a lagoon in the mangroves, I came upon a patch of this plant covering an acre or more. It was a pretty sight, for its glossy leaves resembled holly, and I reflected on how beautiful it would be as a ground-cover near the sea. I gathered every fruit in that whole patch and took them back to the Junk, only to find that an insect had beaten me to them and eaten every seed before it got ripe.

Ned, Hugo and I stole away one morning early and found a tiny settlement called Godji on the islet, Noesa Raloid, at the mouth of a pretty brook that came down from the mountain. As we waded ashore some brightly colored lizards, disturbed by our approach, skipped across the water, using their long tails to ride on. I tried in vain to get one for my friend Dr. Thomas Barbour, but catching such lizards requires apparatus which we had not brought with us.

Beyond the thatched huts a trail led up towards the mountain. We had not gone more than a hundred yards when we came upon the most amazing and the most lovely pandan I had ever beheld. The pandans are allies of the palms and for that reason we were quite as anxious to get them. They are handsome objects in the landscape, especially when their large rough fruits have turned golden-yellow or scarlet. Here was one rising from the bank of the stream sixty feet into the air, with a smooth trunk from one and one-half to two feet in diameter. It reminded us of a Royal palm, but had a crown of narrow strap-shaped leaves that were each twenty feet or so long. The fruits had all ripened and fallen to the ground, breaking up into the long, wedge-shaped nuts of which they are composed. We collected a lot of these, and Marian had a time scraping

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all the juicy flesh off them. Young trees of this beautiful species are now growing on filled land in the Department of Agriculture Garden at Chapman Field, but they have not yet weathered one of the cold winters we sometimes have in Florida.

We climbed the steep slippery trails back into the forest of dipterocarps and spent the rest of the morning hunting there. It was a day that has left a memory on which I love to dwell, along with other forest scenes in which pleasing, quiet personalities have blended with the lights and shades that only a forest's endless variety of form and color can produce.

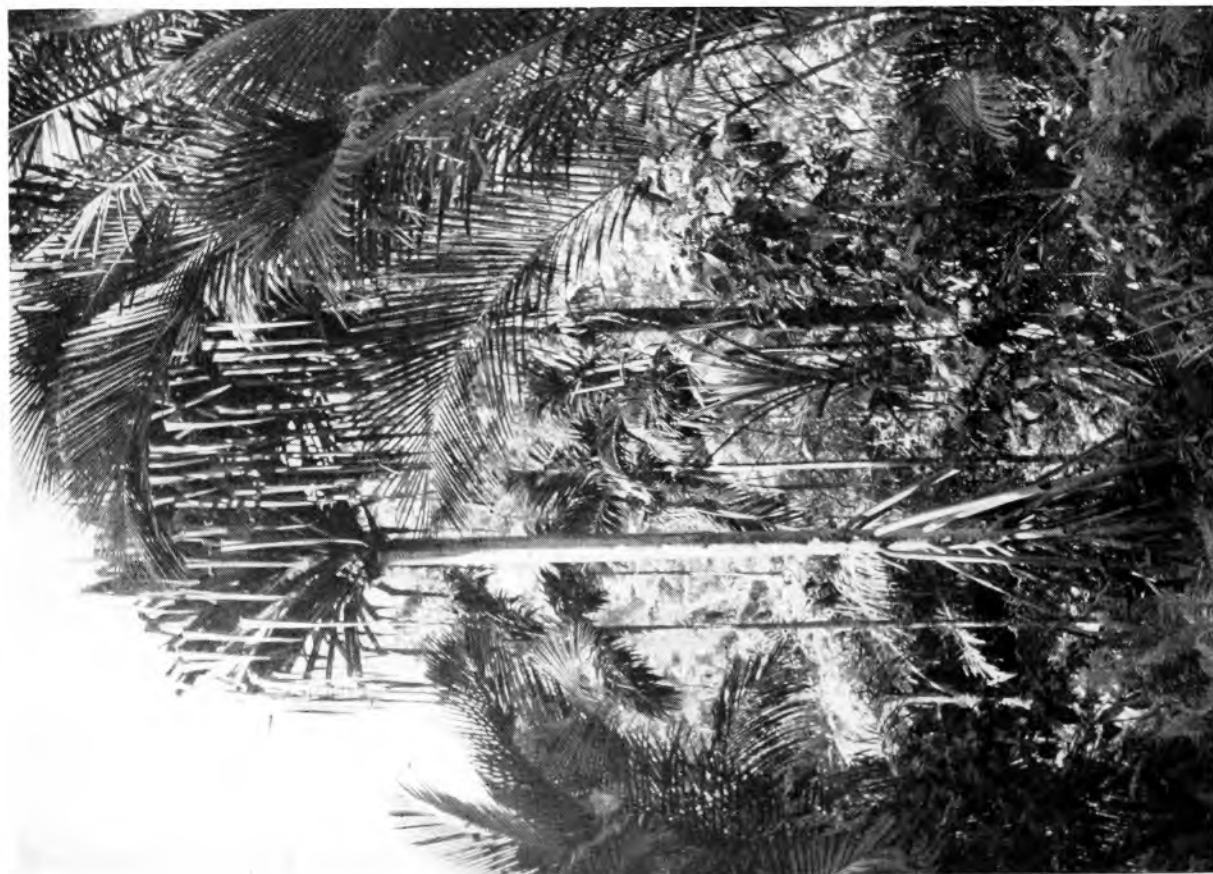
But where was that large-flowered *Bikkia* that van Steenis had told me about? I had almost given it up, when one day the launch rounded some rocky cliffs and there, almost at the water's edge, were its great *square*, trumpet-shaped, white flowers, making a beautiful show against the dark green of its leaves. As it was growing on limestone rocks, I felt sure it would grow on the limestone soils of Florida. Hundreds of seedlings came from the seeds we collected, but in Florida I had the mortification, as the weeks passed, of seeing most of them slowly fade away, unable to accommodate themselves to the new conditions. Only a few are alive today. We do not always know how to treat these little seedling plant immigrants.

We had anchored off the Northwest coast of Batjan Island, expecting to leave the next morning for the coast of Halmahera, when Hugo walked into my study and remarked he was going ashore for a last look around. It was then three o'clock. Ah Fook took him to the shore and returned to the Junk; Hugo was to shout for him when he wanted to return.

Evening came on, but we heard no halloo from the shore. Ah Fook and Fenton patrolled the coast with a lantern, but although they stayed out until long after dark they could get no response to their calls. Marian and I, sitting at the gang ladder, were particularly troubled when we found that Hugo had gone ashore without his knapsack, which contained matches and emergency kit. He had no



Compare this simple machine made of palm leaves with the complicated machinery of a roller flour-mill; then compare the lives of the men who operate the two. We have improved the machines—but how much have we improved the lot of the men?



Right: The sago maker of the preceding photograph, a man as his wife when I gave her a little ring. *Left:* This giant p



whose charm of personality I shall never forget, was as pleased andan, fifty feet tall, grew beside a stream on Noesa Raloid.

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guide with him and that part of the island was not inhabited. It was an exceedingly rocky and difficult terrain; a mis-step, a broken ankle, and the possibility of discovering him in that wilderness would be a good deal like discovering the needle in the haystack. None of us could speak a word of the language of the canoemen who at rare intervals passed along the coast, and while Ah Fook declared "Me find him tomorrow," we knew he himself would soon be lost in the tangled undergrowth.

We thought of Professor and Mrs. Curran at home in Los Baños, and we felt that we were in a measure responsible to them, and should never have let him go off alone, though we knew he had often spent the night in the forest. I can still see the outline of Batjan, dark against the sky, and remember how inscrutable the velvety black forest seemed as the moonlight moved over it and we wondered where Hugo was.

Ah Fook was up at daybreak for, as he expressed it, "No come back, no can sleep." He took us to the place on the rocky shore where Hugo had gone in, and we tried to find, by broken twigs or blazes on the trees, some trace of the direction he had taken, but there were none. Several of the Chinese crew, with Fenton, started into the interior in different directions, calling as they went. A canoe came along and I made the man understand what had happened and he raised his voice, which carried like a steam calliope; then he set off for other canoemen to help in the search. It is amazing how one's imagination can build up possibilities in situations like this.

Towards the middle of the morning, Hugo's "Halloo" came from some distance down the coast, and we picked him up, tired and dirty. He had lost his way in a mangrove swamp too far off in the forest to make his call audible, and, as he expressed it, had been "be-nighted." Making a bed of poles on the stilt roots of the mangrove trees, he spent the night there, uncomfortably of course—but there were no mosquitos, as there would have been in the mangroves of the "Thousand Islands" of West Florida, and it did not rain.

Northward Along Halmahera

IT was with keen regret that we left the Batjan Islands and pushed on to Pajahe Bay, which is on the West coast of Halmahera, an island interesting to those who pore over maps because of its curious similarity in outline to the island of Celebes. Owing to the nature of the anchorage, the danger of winds and strong currents in the open bay, Kilkenny and Ned felt we should not tarry here. But we did get a glimpse of the island, which makes me able to recommend it as a good plant-hunting ground. Hugo, who went up the Bai River for some distance, was most enthusiastic over the wealth of palms he saw.

Back of the village of Bai there was a wood-road through the swamp land, over which swarms of butterflies and dragonflies were coursing, and we set out on it with a Bahassa man to guide us. We had not gone more than a mile before Ned and I stopped short, for there beside the road, backed by a growth of wild grass and *Alpinias*, stood a superb specimen of a *Pigafettia*. The whole stem, from the ground to the immense leaves, was a beautiful dark green, with grey leaf-scars dividing it like the joints of a bamboo. The Bahassa guide said it was not over fifteen years old. It had been left undisturbed, and the dead leaves as they fell had slipped down the stem and had piled up on one another at the base. Ned had his full equipment of cameras with him, and we set to work to register in its details the beautiful scene before us. It took us some time to get our man to climb up into the crown of leaves, for they were protected by thousands of long, slender yellow spines.

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He directed us to a house made of slabs cut from *Pigafettia* palms, and its owner, a wood-chopper, took us back into a clearing to show us some fallen trunks and to explain how he chopped them down. I walked out on one of the slippery trunks, and as he turned and indicated with his axe how very hard the wood was, but how durable for house-building, the whole sad picture of the destruction of the forests of the world came over me. I recalled how, as a boy, I had admired the woodchoppers of Michigan, watching them fell the great walnut and hickory trees which I passed on my way to school. I saw the giant redwoods and sequoias falling; I rode for miles through the burnt-over lands of Canada; I heard the crash that an immense dipterocarp tree had made when it had fallen in the Cadwallader timber concession in Luzon a few months before. Then tables and figures and statistical accounts showing the swift destruction of our American forests came into the picture. And John K. Small's *From Eden to Sahara*, an account of the wholesale destruction of the beautiful plants of Florida, brought things close to home.

I recalled too an afternoon when I attended a meeting of the Academy of Science in Paris with the great African explorer, Auguste Chevalier, and heard him present a list of the plants which had become extinct in France in the past twenty-five years. And here was this little Bahassa woodchopper destroying my pet palm, the *Pigafettia*, to make rough slabs with which to build his house. He dropped his axe and collected for me what seeds he could find at the base of the stump; but though they went through to Coconut Grove by air, none of them ever grew. The only specimens growing here in Florida are from seeds sent in from Sumatra by Dr. Walter Bangham. This palm is probably not common anywhere in the world, and its extinction might readily occur.

From where Ned and I had taken our photographs we could see, above the forest and at some distance, the crowns of a large group of *Pigafettias*; so we made our way there through the swampy ground covered with tangled undergrowth, and were repaid by finding a most superb group, on a slight rise in the swamp. It was

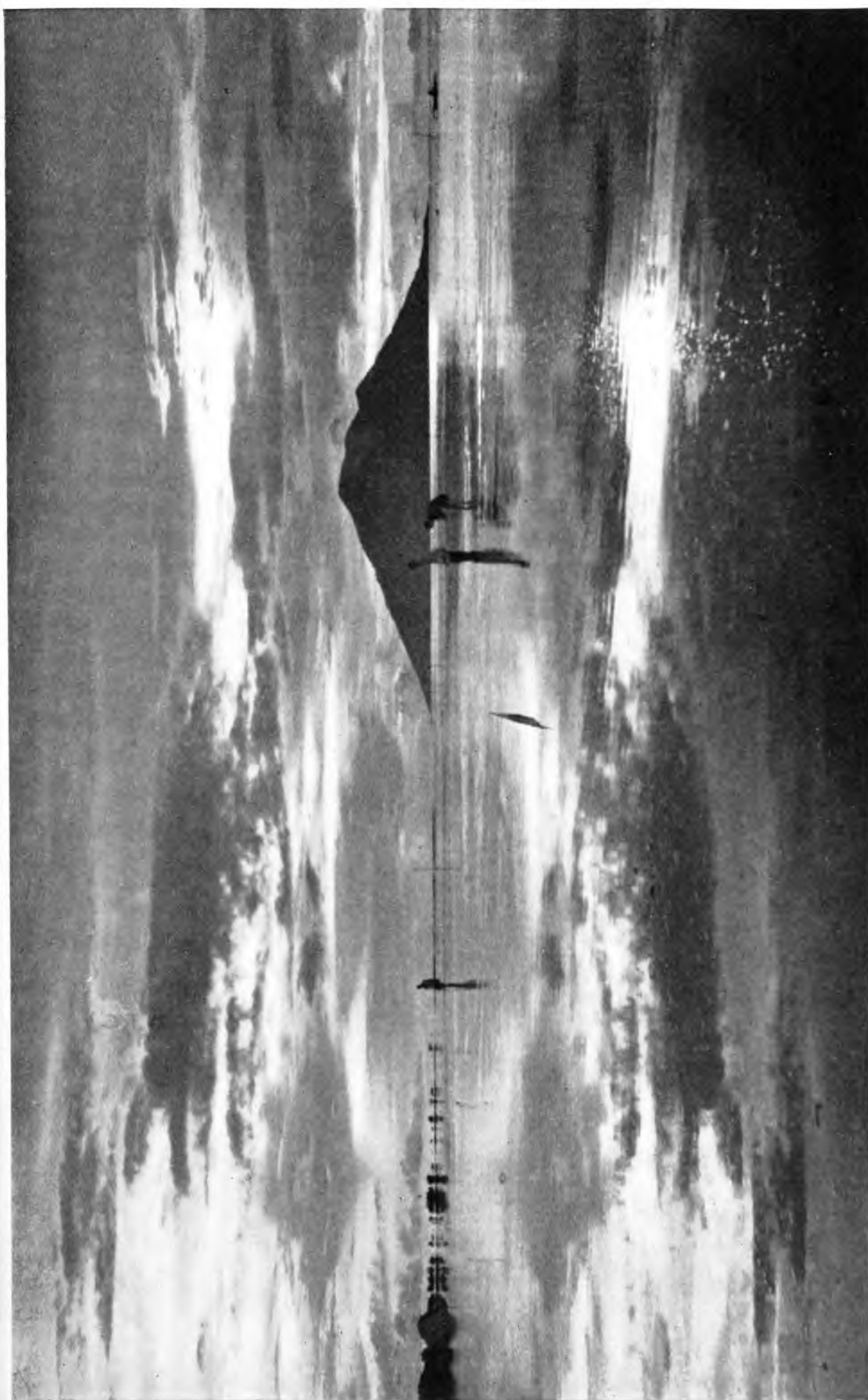
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difficult to estimate their height, but they seemed well over eighty feet tall, and their perfectly straight trunks were grey at the base, merging into bright green for the upper third of their height, contrasting beautifully with the brownish gold color of the spiny plumes. At last I had seen the palm in its perfection, the palm which I had admired first in the little garden of Sibolangit in Sumatra, thousands of miles from its real home. To the Bahassa guide this was merely the "Dokot" palm; to me, the superb *Pigafettia elata*.

It was late next afternoon when we landed at a little wharf crowded with the people of the tiny island of Woda. Marian, the enthusiastic collector of shells, started for the low flat shore, Fenton with her. They found collecting extremely good and wandered far out in the shallow water towards the beautiful island of Moti, behind which the sun was beginning to set. Mrs. Archbold and I were looking over the rather tumble-down village on the shore. Just as the sun sank to the horizon I looked up—and there, outlined against that flaming sky of scarlet and gold, I saw the figures of the two shell hunters and, in the glassy waters in which they were wading, the reflection of the volcano of Moti, rising three thousand feet above them. I think this sunset came nearer to filling our ideal of what the Moluccas have to offer than any other of the many matchless scenes we witnessed.

As we started back to the wharf, the boys and girls who had scampered off to find shells began to return. Nearing the little building at the end of the pier, we saw that Kilkenny had come in from the Junk and had begun to bargain with them. He had brought his tiny bottles of perfume, and the men and women and children had got a whiff of it and were yelling and screaming like mad. The baskets and handfuls of shells of all sorts which Kilkenny "took in" with his perfumes put him far ahead in the race he was running with the ladies.

When the cases of shells arrived in Dr. Clench's laboratory in the Agassiz Museum in Cambridge and I helped to unpack them, this picture of the sunset scene in Woda came back to me, and even the



The sun was setting in scarlet and gold behind Moti, casting its reflection in the glassy-still waters off the shore of Woda Island, as Marian and Fenton waded out to gather shells.



A young *Pigafettia* palm, not over fifteen years old, on the low, wet coast-land of Halmahera. A bright green trunk with gray, prominent leaf scars, and leaves covered with golden spines, make the *Pigafettia* one of the loveliest of the palms.



Ned and I crept through the jungle and waded through the swamp to see this group of magnificent Pigafettias, a hundred feet or more tall. With the sun lighting up their stems, a brilliant green for half their length, they were one of the great sights of the Expedition. 2120



Right: Marian found this prau full of brilliant tropical fishes on Manipa Island a fascinating sight. *Left:* Finding a fan palm like this in the forest, one could almost believe that some lover of formal things had planted it there. This Licuala from Mandioli Island deserves a place in hot-houses and patios.

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farewell shouts of the perfumed natives on the wharfs were constantly with me.

We decided not to stop at Ternate, since to land there might raise questions and cause delays; so the next morning, while the *Chêng Ho* stood by, we visited the tiny volcanic island of Makian which once formed a part of the Sultanate of Ternate in the days of its glory. Both Makian and Ternate are of little importance now.

The "Capella District" or Chief of the group of Kampongs, Ngofakila, was a polite and gentlemanly fellow who made the most of our short visit. Men, women and children scampered to the scene of excitement and we soon had a crowd around us. I noticed that there were an unusual number of babies in arms; we counted six of them. Thinking I might never have a chance to get six baby pictures on one exposure, I asked the Capella to line them up. Then it seemed as though the whole street were filled with children, but the Capella explained that even more of them were in school; so I strolled to the schoolhouse and the schoolmaster, seeing me through the door, invited me to come in. It occurred to me to ask if he taught any music. He smiled, and in an instant dozens of bamboo flutes appeared from below the desks and were waved in the air. The performance was surprisingly good, and included the Dutch national anthem. The teacher explained that each boy made his own flute by burning the finger holes in the thin-walled length of bamboo. Lessons in making rope and in weaving and basketry were also given and I could not doubt that these youngsters were getting an education which trained their hands. Judging from the wall charts, natural history of a sort was also taught. When I look at the photograph of that little school, and scan the faces of the children, I wonder if anybody quite knows how far their abilities as observers could go if they were given the chance to show them.

Just across the narrow strait to the North of us was Moti, and beyond it a speck of an island, Mare; and beyond that, Tidore; and still farther North, Ternate. Where else in the whole world are there to be found four volcanic cones rising from the sea, all within

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a radius of twenty miles? Three of them are higher than Mt. Pelée in Martinique, and three of them have been active in historic times. We passed out from Makian through a narrow passage and skirted along the western shores of these historic islands, once a battleground of the Portuguese and Dutch. To our great disappointment, the peaks were hidden by the clouds. Their slopes are covered with vegetation, and fully revealed, they must be a wonderful sight.

Leaving Ternate behind us, we cruised along the coast of Halma-hera and anchored in South Loloda Bay. Three islands shut us off almost completely from the outside world. And such islands! They rose around us straight up from their narrow beaches, forming pinnacles of rock; but unlike the pinnacles one finds in dry mountains, these were clothed with dense vegetation clear to their tops. Palms and lianas of various sorts, pandans and aroids, seemed almost to tumble from their summits; while caves and tunnels dug by the waves, and the exposed rocks of the cliffs themselves, sculptured by the action of the tropical rains, combined to create some of the strangest scenery I have ever seen. Ned took the height of one pinnacle and found it to be 190 feet.

At night, when the Junk was still, we could hear the sound of a waterfall, and the very first day of our anchorage in this South Loloda Bay, Kilkenny and Marian made a trip across the bay to see it. They returned jubilant with the flowers and large fruits of an interesting tree which they found quite near the falls, spreading its roots out over the almost perpendicular cliffs. The flowers were trumpet-shaped, pure white, and three inches across. The genus *Fagraea* to which it belongs has so showy a flower in another species that it once attracted the attention and praise of no less a person than Joseph D. Hooker, back in 1846, when it bloomed in the Liverpool Botanic Gardens. Still another species scents the whole city of Singapore twice a year with its flowers, and E. J. H. Corner in his excellent book *Wayside Trees in Malaya* says: "after its ghostly flowers, come flying foxes to gorge upon the fruits at night."

The fruits had more seeds in them than even a very seedy tomato,

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and many of these have grown up and made plants that are now in the hands of the garden amateurs of South Florida. One of them is looking up at me now from the slat-house below my study, as if to assure me it is going to thrive here.

We had some difficulty in getting straight the names of the small rivers up which we went in the launch, for the charts are not always accurate and sometimes several names are given for the same river. One of the longest and most interesting was the Soasio or Loloda River, coming down from the mountains of Halmahera and emptying into the bay at Loloda. I recall it because at the close of a rather unproductive hunt for plants, Hugo suddenly spied a very large species of wild banana on the bank. It was quite unlike any banana I had ever seen before, for its copper-colored fruits split open as they mature, and their thick skins curl back from the point, displaying something quite as striking as a large yellow flower would be: a mass of brilliant yellow flesh packed with black seeds. The banana has been passed down to us, seedless, from the time of primitive man, and I had never thought of it as once being a fruit filled with seeds provided with so spectacular a method of distribution. Animals and birds of various kinds could hardly fail to see and eat this banana as soon as it ripened, thus disseminating its seeds.

The scenes around us were charming in the extreme, but the collecting was not good. Only Hugo could scale the perpendicular cliffs, but because of the strong currents, the task of getting him ashore from the launch and of picking him up again with his specimens was a ticklish business. To reach the rocky shore, the man at the wheel had to steer through breakers, and there was danger of wrecking the launch on the boulders. Doubtless these South Loloda Islands will some day yield many new species of plants to some intrepid collector.

So we moved on to the North Loloda Islands, some forty miles farther up the coast of Halmahera, though we did so at the risk of being "discovered" by some police-boat or other. As it was, we had a scare when one of the regular boats of the K.P.M. line passed by

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the narrow entrance to Loloda Bay; but we decided that the Junk must be fairly hard to see.

The small islands of Doi and Dagasoeli were sparsely populated, mostly by fisher folk who appeared to have seen few Europeans. They followed us about whenever we landed, but they seldom asked for anything. They would join in the search for shells, however, and accepted the toys we brought. I offered them salt, having heard that they wanted it, but they seemed to have plenty. One old man, however, begged me for quinine, saying there was much fever among his people. And the fact was borne in upon me that there is perhaps no drug which has relieved more suffering, and saved more lives than this product of the bark of the Cinchona tree from the slopes of the Andes. I was unable to get the drug to him, and I always have regretted the fact, for I had become quite intimate with him as we walked along the beach at sunset, where the dugout canoes were pulled up on the shore.

The waters around these islands were rather shallow and the shell collecting was good; so we went from one little islet to another, some of them quite uninhabited; Ned and I picked out for ourselves separate rocky islets where we proposed to come and end our days.

One Sunday we spent on Toekara as carefree an afternoon as any Northern tourists ever spent on the Florida Keys. The beach was simply swarming with hermit crabs of all sizes and colors; the shallow waters were full of strange-shaped shellfish. Back from the shore rose a steep wall of rock covered with trees and lianas, indicating a tableland of some sort. I found it difficult to climb, but managed to get up and explore the small plateau, without, however, discovering much of anything. I could not help lingering on the cliff, where the branches of the trees and some large vines framed a view of the coast of Halmahera across the water. It seemed a great pity that we were not to have time to get into its interior; but it was something just to sit there and look at it stretched out before me, its range of mountains rising at places to 4,000 feet above the sea.

What is to be the future of this island paradise, I wonder—this

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sparsely settled archipelago of the Great East, unrivalled in beauty, in climate, in fertility—when once the universal highway overhead has brought it closer, and the insanities of war have passed?

But it was time to get down to the shore, for the sun was sinking. The mixture of sand and leaves made the going difficult, and soon I discovered it was easier to slide down than to walk. So I slid. The day had not been unproductive. Just yesterday a pretty little tree which stands beside the walk in the Fairchild Tropical Garden greeted me with its glossy black berries. It was *Leea*, whose seeds I gathered on the shore of Toekara Island, that Sunday in June.

Of the island of Morotai, some thirty miles East of us, I knew practically nothing, except that it was populated by "pagans," a mixture of races with Papuans predominating, and that these natives exported gum gathered from the Dammar trees. Morotai is only 200 miles from the islands off New Guinea. Although the strait separating it from the volcanic island of Halmahera is only ten miles or so wide, its birds, according to the collections made there by Wallace's assistant, Allen, represent many indigenous species. Allen found it a coralline island with sandy soil, and Wallace concluded it must have been separated from Halmahera in some remote epoch. Anticipating no trouble with the authorities, we anchored in the narrow strait of Raeo that separates a small islet by that name from Morotai, and all went ashore and walked up to the tiny Kampong of Toetoe-hoe. Everything was a bit confused in the village, for preparations had been made for a celebration of some sort, and piles of rice and fruits and dried fish were set out on rough benches, and a dilapidated Javanese gong had been hung up.

A stretch of dark, sandy beach from which any shells that were found must, it was thought, be new to the shell men at home, proved fascinating to us. The tide was low, and we walked for a mile along the strand and worked back a short distance into the forest. The dark sand we were on appeared to be made up of finely ground volcanic glass, unlike any sand I had seen before. Our familiar Sea Almond, *Terminalia catappa*, and the *Calophyllum inophyllum*,

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with its beautiful dark green oval leaves, both of which occur on strands throughout the Eastern tropics, bordered a tidal brook and turned my steps up a path into a native's dooryard. Its owner came out to see me, and by means of the sign language, which is very useful and often more reliable than the spoken one, I discovered that some very large, strange-looking seeds, which I had found scattered about on the ground, came from a magnificent tree a hundred feet high, growing back of the strand. Its trunk was too large around for even a native to climb the fifty feet required to reach its first branches and, do what I could, I was unable to discover a native name for it. But those seeds fascinated me as much as the shells did the ladies; so I picked them up, gave them my number 408, and sent them in. Later I saw them growing in the slat-house. They are not yet big enough to be identified.

By this time the sun was setting and we walked back through the village, where the festivities had begun. Several men were taking turns pounding on the rim of the broken gong, from which the center had been hammered out. They made a monotonous and disagreeable noise, but it was the sign for one long-legged fellow after another to show off. With his narrow shield in one hand and his spear in the other, he danced a kind of posture dance and speared innumerable imaginary enemies until he was tired; then he took a turn at the gong and one of the other "warriors" did his stunt. From what little I had seen previously of New Guinea, I could perceive that we were within the influence of the "Papuan culture," if culture it should be called.

There always seems to be difficulty in arranging "terminal facilities," once human beings begin dancing and making any kind of rhythmic noises. The busted gong was still feebly "beating" when we woke the next morning, and I presume many drunks were fast asleep about the village of Toetoehoe.

These natives were distinctly friendly; one of them appeared in the morning, bringing in his prau enough miscellaneous branches of all sorts to cover even a popular hero's grave.

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The news that strangers had landed some distance up the coast from the official port, Wajaboela, had evidently been carried to the Capella Kampong (head man of the village), for as we were going in the launch towards the islet of Raeo, a long prau manned by several oarsman and bearing a flag signalled us, and we saw that one of the men was wearing a white cap. There was some question as to whether we should stop or disregard him and simply go ahead. If he were the Capella, however, we knew that he could assemble a hundred praus about the Junk and perhaps board her. So we took him in with us and, with his prau in tow, went to his village of Wajaboela. He could talk Malay and I undertook to explain that the *Chéng Ho* was carrying a scientific expedition and was authorized to visit ports in the "Groote Oost." He was a reasonable person and took me into his neatly kept kantoor. Upon the table was lying an old copy of the *National Geographic Magazine*, and he proudly showed it to me. I pointed to my own name in the list of the Board of Directors, thinking to substantiate my explanation that the Junk was an American one, and on an official mission, with all its papers in order. We thought he seemed satisfied, and he even accompanied us about the village and took leave of us very politely.

But just as we were pulling away from the little wharf, a thought occurred to him to disturb him: he had not seen our official papers. What would he be able to say to his superior, the Controller, who lived at Tobelo, forty miles away on Halmahera? He rushed down to the wharf with two soldiers and insisted on being taken to see the papers. Since he could not read a word of Dutch, the papers we showed him did not serve to quiet his fears about the Controller in Tobelo. "Why can't you go to Tobelo and see the Controller?" he kept repeating. He finally agreed to let his men gather up all the shells they could find on the beach of Raeo, going in the launch to do it; but no amount of persuasion on my part, or coaxing on Kilkenney's, would change his decision not to let us leave the Junk again. He had heard that terrible, insane word "prang."

At 5:45 A.M. on the 10th of June, it was "up anchors and away,"

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bound for the Talaud Islands, a "zelfbesturend landscap," as the Dutch call an independent province.

These islands were nearly 150 miles distant across the open ocean. If the weather was stormy, the whole sweep of the Pacific could get at us, and the currents were not very well marked on the chart. Ned was navigating officer now, as I have said, and Hugo and Fenton stood their turns at the wheel, with Kilkenny never far away. Rough weather on a small boat like the Junk is fun in the day-time, if you are a good sailor, but at night your imagination comes into play, especially if the boat is not brightly lighted. I stuck to my laboratory and busied myself with my specimens and books, bracing myself against the wall and between tables and shelves. About midnight Marian, who had been in the large deck room, made her way in the dark along the deck and appeared at the door. The boat by this time was over on her side a bit and Marian had difficulty getting to the laboratory.

"It's pretty rough, isn't it?" she said. "Do you suppose there is any danger? If we are going down I'm going down with you."

And with that she dropped to the floor and sat at my feet, bracing herself against my chair, and spent the remaining hours of darkness there. This was really our only night of anxiety during the whole voyage, and our fears were perhaps not entirely unwarranted, as it appeared next morning, when Ned remarked that the Junk had drifted forty miles out of her course during the storm.

One of the difficulties in my laboratory was to keep the books from pitching out of their places on the shelves. A narrow strip at the bottom, and a broader one at the top, normally served to keep them in, but in stormy weather I had to tie a strong cord across their faces. The shallow drawers of the cases kept the tools in order and my microscopes were screwed in their cases to the wall. The windows were hinged at the top and opened outwards, and I was often kept busy opening and closing them, or getting the Chinese crew to adjust the sail which shaded my desk, for nobody can work with books when tropical sunlight plays across the table, shifting with

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each dip of the boat. Altogether, however, that little laboratory, so made that it could be removed at the close of the expedition, was a great success. Even the fire in the engine room right below it, though it had charred the timbers, had not disarranged things much. But the room was too small for the work of pressing and drying the large specimens of palms and other plants which Hugo brought in, and that work had to be done by Fenton on the dining room table below decks. But the drying tunnel worked perfectly, and without it many valuable seeds would have molded and been lost.

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Catamarans Do Capsize

IT was five in the afternoon when we anchored off the coast of Karakelong, the largest of the Talaud Islands. The catamarans with their outriggers came skipping over the water in droves to greet us. Some held old men, with boys to paddle them; others seemed filled with whole families, even including roosters for sale perched on bamboo poles; and others were gaily but not too securely handled by little tots of six or seven who, when they capsized, scrambled back into the tiny shells and kicked the water out, using their feet to bail with.

Before leaving home we had been told by Mr. Clench that among the millions of shells in his collection, he did not have a single one from the Talauds. "Every shell you get there will be of interest to the conchologists of the entire world," he had said. No wonder then that there was a general scramble to get ashore, for if shells had not been collected here, in all probability neither had seeds. Back and forth the launch went all next day, with everyone working at top speed. When the launch failed, the praus carried us. A dozen women and children followed Marian about all the morning, and such a big haul of shells resulted that she had to spend most of the rest of our time there cleaning them. Shell-cleaning can't wait, for the little animals inside them die and decay, and there would have been no living on the Junk if they had not been taken care of promptly. Kilkenney developed his own technique for getting hermit crabs out of the shells, one which Mr. Clench said was new to him.

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He would fill a tin can with them, then put the cover on tight, and by morning the crabs, seeking air I suppose, would all have come out of the shells and would be dead.

Hugo started for the other side of the island, and I struck a trail along the shore, back of the landing-place, where a group of rather fair-skinned, pleasant-looking people had gathered. One of them undertook to be my guide and led me to a cave under the hill, probably a burial place for some holy men, for I saw a number of skulls and parts of skeletons. I fear I was unappreciative, for even if I could have understood what he said, what could I do with the history of the Talaud heroes? What I wanted was some seeds to grow. Along the roadside some scrubby trees and shrubs were covered with tree snails, and as I began to collect them, several men gathered about me, and soon I had them getting me seeds, snails, palms in flower—anything they thought I would buy.

It was surprising what a variety of interesting plants they assembled, among them a *Boerlagiodendron*, which has two kinds of fruits—one sterile kind to attract the pigeons, and the other for its own reproduction—the same that Ned and I had seen in Zamboanga. And when I got back to the landing-place there was a crowd of men and women waiting for me with bunches of flowers of various species, the handsomest being a beautiful *Ixora* of unusual size.

Hugo reported seeing lots of snakes on the other side of the island. But he knew better than to offend Tien Fei again by collecting snakes. He had walked over twenty-five miles through the forest, and didn't get back until nearly eleven at night, footsore and pretty well tired out. His guide was exhausted, as his native guides were apt to be, and declared that Hugo was a wild man; that he even walked while he was eating his lunch.

Hugo brought back, however, a most exciting thing—a long spray of gorgeous, flame-colored flowers, each nearly four inches long. I have never seen the famous d'Albertis Creeper of New Guinea, *Mucuna bennetti*, in bloom, but Hugo's find corresponds

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so closely to photographs of that magnificent flowering liana that I imagined now that I was looking at the real thing. For years we had been trying to establish it in Florida, and once we had a little plant of it growing out-of-doors. But a severe freeze killed it, for it was not large enough to resist the low temperature. Hugo described the single vine he had seen as covering a tree fifty feet high, with 400 to 500 immense flower clusters like the one he brought. The tree stood out in the open, on sandy, volcanic soil, and was an utterly glorious sight.

But where were the seeds? Of course a vine of this kind does not usually have seed pods on it when it is in full flower, as this one was. "Not finding a single seed, I made all these cuttings," said Hugo. Vines very often can be struck from cuttings, but not always. Every effort was made to get these to start, but they all failed. "He should have dug the liana up and brought in the whole thing," some gardener will rightly say. But from experience I know that even this does not always ensure success. Besides, for a man on a strange island many miles from base, with no tool but his machete, it is not so easy to dig up the roots and trunk of a creeper two inches in diameter, especially with nightfall approaching. And since no pods could be found, the botanical identity of this lovely vine cannot definitely be established.

It was nearly time to leave the Talauds. But I had noticed, as we came into the anchorage, a rocky headland which, through the glasses, appeared covered with a veritable forest of pandans. Marian and I had made an attempt to reach it late one afternoon in the launch, but the shore was rocky and we could find no safe channel through the rocks, which appeared and disappeared with the rising and falling of the surf; and to capsize in such a spot would mean certain disaster.

I was determined, however, to see those pandans; so next morning, with the idea of landing farther down the bay and walking to the headland, I proposed to Ned that we go ashore in a couple of the

One of the many pinnacles which rains and waves have carved from the soft rock of the South Loloda islands, off Halmahera. This one was 290 feet high.



Left: Few fruits are more decorative than this red fruit of a pandan from Loloda Island.
Right: The palm-leaf cup used by this Bahassa boy of Halmahera is now in the Palm Museum in Coconut Grove.

Over-population, one of the greatest problems of our time, was in evidence on the tiny island of beautiful Makian, so filled with children that none has a fair chance in life.



Left: The praus of the Basa river on one of the North Loloda islands struck us as masterpieces. An old, gray-bearded man was launching one as we passed. *Right:* A handsome flowering tree, *Intsia bijuga*, which grows so near the shore that its flower clusters overhang the surf, on Dagasoeli Island, North Loloda.

Catamarans Do Capsize

praus which were always hanging around the Junk, and which looked absolutely safe. We had ridden in them before and their outriggers give one a feeling of security. Ned went to get one of his cameras, and meanwhile I picked a good-looking catamaran with a lively boy to paddle it and got in, sitting on a cross piece, for I could not squeeze myself down into the narrow bottom. We set off, with Ned following in another prau. The water was calm and the canoes made good speed. But mine had the start.

I was halfway across when I heard Ned calling out: "David! I'm sinking! I'm sinking!" I managed to turn around to look, and sure enough, there was Ned, holding his camera above his head, with the water already up to his waist as the prau slowly settled. I yelled at my boy to turn around and go to Ned's rescue; but he refused, until my fury drove him to the effort. I had not realized that quite a strong breeze had sprung up.

As my boy tried to turn, to my dismay I saw the bamboo pole that formed our starboard outrigger slowly go down, and felt myself being quietly and gracefully tipped out into the water, as the whole framework of that "safe-looking craft" turned completely over. My pith hat floated off, but I grabbed it and hung on with one hand to the canoe, calling for help with all my might. For though I can swim, my poor legs have a way of getting the cramps after a short time in the water. Besides, I could see through the waves that Ned was in a worse fix than I was. He was trying to save his camera. And the wind was rising.

Ah Fook, always on the alert, saw us. He was over the side and in his launch and after us in a hurry, and like drowned rats, we were pulled out of the water and taken back, disgraced, to the Junk. Ned's canoe had sprung a leak and had begun to fill before he was a hundred yards from the Junk. Luckily the camera soaked now with the salt water was not his best one. My glasses had gone to the bottom and my watch was wet through; otherwise "no damage was sustained."

But I still have a feeling that those pandans on the rocky shore of

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Karakelong would have turned out to be different from any others we saw.

Mrs. Archbold announced the next morning that we should leave at once; so as soon as Ned had taken his colored photographs of the plants Hugo had brought off, which he could not do while the Junk's engines were going, the anchors were hoisted and we bid good-bye to the Talauds, hoping vaguely to return some day.

The *Chêng Ho* made excellent time across the Celebes Sea, regardless of the rough weather, and in a day and a half's time we were anchored in Zamboanga Harbor, three hundred miles away. We had left there on the 18th of January and were returning on the 16th of June.

By this time the war news had become more and more depressing. All hope of returning to the Dutch East Indies was definitely out of the question, and every one told us it was increasingly difficult to get passage to the United States. Accordingly Marian and I decided that the time had come for us to try to go home. Ned felt the same way. And there in Zamboanga, the Fairchild Tropical Garden Expedition on the *Chêng Ho* came to a close.

Marian and I shall long remember that rainy afternoon when we pushed off for the last time from the beautiful Junk in which we had visited so many strange harbors, and to which we had come back so often laden with seeds and shells. We bade the loyal Chinese crew farewell, and as their kindly faces smiled down on us for the last time we wondered what would become of them when they got back to Hong Kong.

Mrs. Archbold went on to Cebu, where the Junk was overhauled. Having arranged for a new captain and crew, she flew home. Kilkenny went back to Bali, later returning to America, and marrying, under our Java fig tree, the girl he fell in love with when she came to see the Junk in Zamboanga. Hugo took a position with the Philippine Packing Corporation in Mindanao, but where he is now we have no way of knowing. Fenton joined up with the yacht

Catamarans Do Capsize

Yankee in Bali and sailed home with her around the Cape of Good Hope.

Marian, Ned and I said good-bye at night on the pier to our Manila friends, never imagining how complete would be the silence which was to envelop them.

The Plants Come on the Stage

WE were going home. But not as the botanist does who returns to his herbarium with bundles of dried specimens to be poisoned and "worked up" in order to make a place for them in history, after they have been named for some of his friends, perhaps. Nor were we like the zoologist Koch, who was aboard with forty cases of wild animals. He was worried lest they die before he could put them on exhibition in the Los Angeles Zoo. We were going home to hundreds of thousands of little seedlings which were already growing up and getting ready to make their début as Plant Immigrants on the stage of American Horticulture.

We had gathered over five hundred different kinds of plants. There were ninety-odd species of palms among them, collected on our land journeys over Luzon and on the cruise through the islands. Tall, slender, graceful Livistonas for patios; larger feather palms like the Buri for parks and roadsides; and delicate ones like the Pinangas for small dooryards—not to mention the Rattans from which the public would have to be protected, or the sugar palms which yield delicious jaggery sugar.

Then there were the Pandans with their brilliant fruits to be grown on the lowlands, and in the future to be used, perhaps, by makers of mats. And various new fruits, some of them destined, I hope, to join the growing ranks of those which have already been established in South Florida.

Of the many shade and ornamental trees we had picked up, I



Captain Kilkenny and his bride just after their wedding, under the Javanese Ficus tree on our terrace. It was under this tree on The Kampong that this book was begun and finished.



Left: The belle of Karakelong, largest of the Talaud Islands, brought us clusters of the strange flowers of *Boerlagiodendron*. *Right:* Hugo's Talaud Island guide with the specimen of a solitary feather-palm. The leaf stem is streaked with yellow; fruit cluster, stem, and fruit are red.

The Plants Come On the Stage

felt pretty sure some would be spectacular performers. I was confident that some of the numerous vines for Mrs. Semple's Vine Committee would be attractive, either because of their beautiful flowers or their showy berries, and would be spread to little arbors in private gardens.

Of course I realized that some of the less obviously important immigrants might steal the show—one like Marian's *Fagraea*, or Mrs. Baker's *Nauclea*, or the white flowered *Clerodendrum* from Minahasa, or the *Callicarpa* with the red berries which the birds were so crazy about, or perhaps even the *Malindjo* which is so important in the diet of the Great East.

As we travelled homeward across the Pacific we went over our notes and our three thousand photographs, planning the lectures we thought of giving to advertise our show of new plant immigrants. For the plants must now come on the stage and start their own careers.

Now the old man is back again under the same big tree in The Kampong where he began his story at twilight. By this time the full moon is setting in the West and shining through the archway, lighting up here and there the yellow leaves that have fallen from the *Hernandia* tree during the night. The East is beginning to show the rosy tints of sunrise, for the hands of the clock point straight up and down, and soon the sun will rise above the bay. Against the sky in the moonlight I can distinguish the outlines of my trees and vines—the mahogany tree which was brought over from the Key long before we came here; the cluster of palms on each side of the entrance, which grew from seeds I gathered in the Cameroon when I was there with Allison Armour and the Whithouses on the *Utowana* and which Professor Bailey decided was a new variety; the big *Carissa* bush I first saw in Durban in 1902; that lovely flowering tree, *Brassaia*, which has been in bloom for weeks, alive with bees and birds, and which Walsingham got from Queensland; the fan palm with its tousled leaf-ends sparkling in the moonlight, that

Garden Islands of the Great East

one which Bob Montgomery gave us. And I see the shadow on the grass cast by my *Pithecolobium*, named after Junghuhn, the German explorer of Java. The tips of the *Combretum* vine we got at Bathurst in Gambia appear black in the moonlight, but soon will be brilliant red when the sun strikes them. And in the distance, rising high above the mango trees, are the waving plumes of an Indian bamboo which I planted in a low place near my study.

As I write this down in the moonlight, I hear a faint noise, and coming down the path on his bicycle is the newspaper boy, bringing news from around the world—from a world gone mad.

I turn to greet the sun while the moon still shines above the trees in the West. I hear the throb of a propeller, and against the gray sky beyond my lone pine-tree I see a light no larger than a star. The throbbing grows fainter and fainter; the tiny light fades in the thin clouds which are beginning to glow from the sun below the horizon. As the wings of the plane disappear I have a feeling that the boys who guide it are flying in a straight line, almost from our doorstep, to battle in the hills of Tunisia where the fighting is—perhaps to perish there.

I am glad it is too dark to read, and I lay the paper down. The birds are twittering in the trees. The scene before me changes every moment. And there is Marian, standing beside me. Dawn has broken, and we sit and think of those other dawns in other places of the earth where we have been.

We are back home again among the living souvenirs of our years of travel, and knowing that we must close this book we have written, Marian suggests that we might close it here where we began it—under the Java *Ficus* tree where now one of those carved stone images of Bali has found a resting place.

Perhaps the old man only fell asleep and rambled through the "Groote Oost," and, waking, found that what he told about was nothing but a dream.

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FAIRCHILD GARDEN EXPEDITION

CRUISE OF CHENG HO

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